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COMPARISON OF TWO METHODS OF TEACHING READING IN GRADES 5 AND 6.

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BASAL READING (BR) AND INDIVIDUALIZED READING (IR) METHODS OF TEACHING ELEMENTARY SCHOOL CHILDREN TO READ WERE COMPARED TO DETERMINE THEIR CONTRIBUTION TO SKILL IN CREATIVITY AND PROBLEM-SOLVING. TEACHERS (N 29) WERE SELECTED TO PARTICIPATE IN THE STUDY. FIFTEEN TEACHERS WERE DIVIDED INTO A RANDOMLY ASSIGNED (RA) GROUP AND A TEACHER PREFERENCE (TP) GROUP. THE RA TEACHERS WERE PAIRED ACCORDING TO RATED COMPETENCE AND YEARS OF EXPERIENCE. EACH TP TEACHER TAUGHT TWO CLASSES, ONE BY EACH OF THE TWO METHODS. THE FIFTH- AND SIXTH-GRADE PUPILS IN THE PARTICIPATING TEACHER CLASSES WERE TESTED BY PRE- AND POST-TESTS PROCEDURES. A LIST WAS KEPT OF ALL BOOKS READ BY THE SUBJECTS DURING THE SCHOOL YEAR. THE RESULTS INDICATED THAT IN THE IR PROGRAM, THE CHILDREN READ MORE BOOKS. HOWEVER, THERE WERE FEW SIGNIFICANT DIFFERENCES IN CREATIVITY AND PROBLEM-SOLVING TESTS RESULTS BETWEEN THE GROUPS. FURTHER RESEARCH WAS RECOMMENDED TO EXPLORE THE RELATIONSHIP BETWEEN METHODS OF READING INSTRUCTION, CREATIVITY, AND PROBLEM-SOLVING. (RS)

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Cooperative Research Project No. S-183

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by David A. Thatcher, Ed.D.
University of California
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The research reported herein was supported by the Cooperative Research Program of the Office of Education, U. S. Department of Health, Education and Welfare.

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This study was carried on as a doctoral study project at the University of California, Berkeley. A few changes have been made in this report since it was submitted as a dissertation. Two short sections have been added, and some changes in wording have been made. The reader is referred to the Foreword.

I would like to thank the many people at the University of California who have helped with this study. First, my thanks go to Dr. J. Cecil Parker, chairman of my doctoral committee, who gave me help and advice at many stages of the project, and who has been a staunch friend throughout. Dr. Lloyd Scott, Dr. Robert Ruddell, Dr. Read Tuddenham, and Dr. Paul Seabury all gave helpful advice and assistance. Dr. Val Arnsdorf, a former member of my committee, encouraged and advised on several occasions.

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Many teachers and administrators contributed to this study. I thank the many administrators, both central office personnel and building principals, who gave support. Special thanks are due the teachers for their interest, their hard work, and their willing cooperation in a project that inevitably meant extra work for them.

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My heaviest debt of gratitude is to my family. My wife Shirley worked on the many complex details of producing the mimeographed tests, on the bibliography, on editing, and typing. I thank my children, Ellen, Maris and Todd, for help in mimeographing, collating, stapling, bundling and counting the tests. Without the help, patience, and encouragement of my family, there would have been no dissertation.

FOREWORD

The form as well as the content of language is important in communication, academic as well as personal. I have decided to use the first person at times in this report. The decision can be justified on the ground of directness. I, the person who did the reading, the directing of the research, and the writing up of the whole project, am reporting to you, the reader. Whatever I say, no matter the grammatical form, I am saying it. To me it seems desirable to be explicit about this. To do so throughout might tend to make the paper tedious, and so in general the more conventional third person is used.

But my reasons go farther than this, my own preference for being explicit. A psychological rationale for this position has been stated by P. W. Bridgman in The Way Things Are. (Bridgman, 1959, preface and pp 1-11) In any human interaction, he says, there are essentially two parties, the person performing an "operation" and the observer. In the present instance, I am the performer, and you are the observers. This focus on operations or activities and an expository use of the first person "...emphasizes the insight that we never get away from ourselves. Not only do I see that I cannot get away from myself, but I see that you cannot get away from yourself.... The brain that tries to understand is itself part of the world that it is trying to understand." (ibid, pp 5-7; G. Murphy, 1958, p 115) So, rather than trying to escape through the use of conventional third person, I will frequently acknowledge my inability to do so, and present my case to you as my point of view -- which it inevitably is, and which you know it inevitably to be. Thus, whenever I say, "It appears..." or "We believe...", this can be translated into the first person. (ibid, p 80; Conant, 1951; Eiseley, 1957, p 6; Eiseley, 1960, p 4)

Citation of the information and ideas borrowed from others will be presented as follows: When referring to an author, for example, J. Cecil Parker, I will place the author's surname (and identifying initial where needed) and the date of publication in parentheses. Page numbers will be referred to in books. Complete citations of each source will be found in the bibliography. In a few cases, books and monographs will be identified by the organization which sponsored them. This applies especially to yearbooks published by the Association for Supervision and Curriculum Development, and the National Society for the Study of Education, and to a manual published by the New York City schools. These will be identified by the organization's initials and the date, and pages will usually be listed. When an author or an organization has published more than one book or article in a given year, a letter will be affixed to the date in parentheses (for example, 1959A) to distinguish one reference from another. Mimeographed materials referred to include several useful articles sent to me by Dr. Jeannette Veatch, Dr. Walter Barbe, and Dr. J. Richard Suchman. These will be identified as completely as possible; in several instances, the date is lacking.

In many paragraphs, a number of citations will appear. I have, in most cases, placed them at the end of the paragraph so as to maintain continuity in the paragraph. When several points have been made in a paragraph, the citations are placed in the same order as the points they support. When a quotation is used, the citation will usually be given at the end of the sentence.

Visits that I made to the classes participating in the study will be cited as follows: The identifying letter X will indicate an experimental class, a C a control class; the following number in each case will designate the teacher, while the final number will indicate the number of the visit; they were numbered serially in calendar order. The initials TP in front of the other letters and numbers will indicate that the teacher is a member of the "teacher preference" group. For example, (Visit C-5-4) would mean the 4th visit of the school year to teacher No. 5 in the control group. (Appendix 3)

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CHAPTER 1

INTRODUCTION: THE REASONS FOR THIS STUDY, DESCRIPTION OF THE TWO METHODS OF READING INSTRUCTION, AND DEFINITIONS

> "The more we are able to see,
> the more we look for.
>
> The more we question,
> the more there is to question....
>
> The more we experience,
> the more we want to experience....
>
> The more we contemplate,
> the greater is our need for contemplation."
>
> (Bass, 1964)

INTRODUCTION

Reading, the fundamental "tool" subject in any educational system, is a matter of concern throughout the United States. Are we teaching boys and girls to read well enough to meet the demands of adult life in our society? Are there different techniques which teachers can use to achieve better results in the teaching of reading? Are there some skills recognized to be of greater importance today than formerly, skills that can add appreciably to thinking abilities valuable in modern life? The latter two of these are the general questions to be considered in this research. Specifically, will individualized reading enable 5th and 6th grade students to score higher than students in basal reading on tests of creativity and problem-solving? (Umans, 1963, p. 1)

RESEARCH DESIGN

The two methods of teaching reading compared in this study are the traditional basal reading and individualized reading. A group of teachers of grades 5 and 6 was selected and then divided into experimental (IR) and control (BR) groups. The students assigned to these teachers were tested in the fall of 1963 and the spring of 1964, using Torrance tests of creativity and Covington tests of problem-solving. Between September 1963 and June 1964, the experimental students experienced IR while the control students experienced BR. Basal readers and other books read by each student were counted so that comparisons between the experimental (X) and control (C) groups could be made on the number of books read (Appendix 1)

The specific questions for which answers will be sought in this study are:

1. Will students in IR and BR read the same number of books during the course of a school year?
2. Will students in IR and BR gain equally on measures of creativity and problem-solving comparing post-tests with pre-tests?
3. Will boys differ from girls on the above criterion measures?

It will be assumed that the students in the study have memorized a stock of words in the years before participating in the study, and that they will also have mastered a repertoire of skills to be used in gaining understanding of new words encountered. It will be further assumed that they have acquired a number of abilities necessary for apprehending meaning from sentences, paragraphs, and selections they read. (Appendix 2)

GOALS OF READING INSTRUCTION

Before describing the two methods of reading instruction which are compared in this study, it would be well to outline the aims of an instructional program in reading. The following list is designed to be comprehensive but brief; a great deal has been written about each of the goals listed. Also, it would be well to remember that the goals of both the two methods are comprehensive and, in many ways, comparable. (Betts, 1950, pp. 83-99; Gans, 1963, pp. 15-18; Veatch, 1959, pp. 192-202)

The goals are as follows:

1. To help the child make a transition from the use of spoken language only to the use of both spoken language and written language. In the process, to show the child the utility of arbitrary symbols, and to teach him to associate these symbols with meaning. (Ashton-Warner, 1963, pp. 27-42; Ruddell, 1965; Lee and Allen, 1963, pp. 1-9)
2. To teach the child word recognition and word-unlocking skills.
3. To teach the child many comprehension skills, from sentence meaning to paragraph meaning to ability to select the main points of a selection or the moral of a story. (Heilman, 1961, pp. 187-193, 271-273)
4. To help the child to judge when his needs can be satisfied through reading: whether needs for information, in a school setting, or needs for personal satisfaction. (A. J. Harris, 1963, pp. 266-273)
5. To provide the child with the ability to adjust his speed and style of reading to the requirements of the particular material being read. (McKim & Caskey, 1963, pp. 338-343)
6. To afford the child opportunities to enjoy books; and the companion aim of becoming acquainted with what is judged to be the finest in literature. (Russell, 1961, pp. 362-453)
7. To encourage the child, as an extension of his mastery of elemental comprehension skills, to wrest meaning from printed material, to compare the ideas in various sources, to ask questions of himself occasioned by his reading, and to seek appropriate standards of judging the content and style of what is read. (Gans, 1963, pp. 13-18; Bloom, 1956, pp. 204-207)
8. As a further extension of the comprehension skills, to help the child appreciate and learn to take advantage of opportunities for creativity and problem-solving through reading. (Spache, 1963, pp. 82-93; Dechant, 1964, pp. 372-383)

DESCRIPTION OF INDIVIDUALIZED READING AND BASAL READING

What is the nature of the two methods of reading instruction? Basal reading, also known as developmental reading, or ability-group reading, is the dominant method of teaching reading used at present in the United States. It involves use of a pre-planned program of instruction. Such programs provide sequential steps, including planned repetition, for the teaching of many specific skills for a given series of grade levels. Most often, such a pre-planned series of books and lessons covers grades 1 through 6. (Austin and Morrison, 1963, pp. 3-4; Durrell, 1956, pp. 21-23; Dawson and Bamman, 1963, pp. 132-146)

These books and lessons are prepared by a team of experts who collect (and sometimes write) short stories using a controlled vocabulary. Controlled vocabulary means that a certain number of new words are introduced at each level of instruction. For example, the basal reader series published by Scott, Foresman & Co. introduces eighteen new words in the first pre-primer, and 150 new words in the first reader. The stories are arranged in groups, each group having a theme, such as "Animal Friends" or "Frontier Days." (Robinson, et al, 1962, p. 189; Gans, 1963, pp. 118-135)

The experts also prepare a teacher's manual for each book in the series; the manual contains detailed directions for teaching each story, such as introduction of new vocabulary and unfamiliar concepts, and directions for a variety of reading activities by students under teacher direction. These may include directed reading, silent reading, skimming, review or discussion, and extension and creative types of activities. The experts also prepare, in most cases, a series of workbooks, one workbook to accompany each reader in the series. The teacher's manual refers the teacher to appropriate pages in the workbook which are designed to provide students with practice in skills being stressed in the teaching of the particular story, or skills which have previously been taught but which must, in the view of the experts, be reviewed and practiced in order to maintain mastery. (McKee, et al, 1962, pp. 165-169; Hester, 1964, pp. 293-294; L. Gray, 1963, pp. 177-178)

In teaching basal reading, most teachers divide a classroom of children into three groups, according to their approximate level of ability in reading as measured by standardized tests and as determined by teacher judgment; usually both factors are considered. Each group is taught separately, and usually will meet with the teacher three or four times a week. Some teachers also feature "cross-group" grouping in which more functionally homogeneous groups can be formed for the teaching of particular skills by bringing in children from two or more of the regular reading groups. Many teachers also teach children individually at some times, depending on the child's need, and available teacher time. (Dawson & Bamman, 1963, pp. 84-86; Durrell, 1956, pp. 126-127; Veatch, 1959, p. 7; Russell, 1961, p. 155)

Many teachers also encourage children to use some of their time, after finishing assigne reading lessons, in free or self-selected reading. There is explicit recognition of the importance of children's interests as a motive for effort and success in such independent reading. But most of the child's work in reading in a BR program is spent using his basal reader as a member of his regular group, or in reading or doing teacher-made exercises or the workbook as assigned to his group. (Witty, 1949, p. 49; McKee, 1948, pp. 260-26

As the child progresses through school, more and more of his work in the social studies, health, science, mathematics, and other subjects depends on his success as a reader. Advocates of BR stress the importance of teaching both the general skills and the skills needed in specific content fields. (Strang et al, 1961, pp. 114-193; A. J. Harris, 1963, pp. 304-

In summary, BR is a method in which the teacher teaches groups of students, using basa readers and the auxiliary materials that go with them. Developmental lessons from the reader are presented in a sequential pattern to ensure original learning; later lessons provide review and reinforcement. Children are also encouraged to read widely, to use reading for various instructional purposes, and to develop a taste for good literature. This summary wil be used as the definition of BR in this study. (Gates, 1962; N. B. Smith, 1960)

By contrast, individualized reading gives the child the privilege of selecting most of his reading material, of reading at his own pace, and of many individual conferences with his teacher. Beginning with grade 1, the teacher introduces the child to reading, in many cases starting as the BR teacher does with the child's own language and the child's own experience as the raw material of talking, story-making, and later, reading of printed words. As soon as he has a fund of recognized words, the child chooses his own reading material, though the teacher may provide advice. If the program is to be successful, a substantial number and variety of books must be available to the child every day. According to the reading specialists familiar with IR, the child should be allowed to read at his own pace. (NYC, 1960, pp. 5-7; Lee & Allen, 1963, pp. 5-9; Veatch, 1959, pp. 7, 10-11, 18-20; Miel, 1958, pp. 20-21)

The teacher has individual conferences with her students. Conferences may be initiated by the teacher, the student, or both. In each conference, the teacher will find out what the child is reading, will diagnose and treat his immediate here-and-now skill building needs, will make a written record of those skill needs, will plan ways she and the student can assist him in moving forward in reading ability, and will encourage him to get as much as possible from his reading. This may involve some sharing activity or some creative activity by the child. (Barbe, 1961, pp. 26-27, 45-49; Visit X-3-5; Brogan & Fox, 1961, pp. 248-255)

As a result of her diagnosis in the conference, the teacher may assign some specific reading work to the child, and later check on his success in performing that assignment. Both in the conference and in the work done as a result of the conference, specific developmental reading skills will be stressed. The teacher's written notes of particular skills in which each child excels and in which he needs to improve, will help her in providing appropriate individualized instruction for each student. When properly taught, individualized reading is a systematic approach to the teaching of reading skills to individuals. (Miel, 1958, p. 5)

In addition to word and comprehension skills, the teacher in an individual conference facilitates the discussion of personal meaning for each child. This may encourage the individual to develop his own standards of judgment, faith in his own taste, and willingness to venture his own ideas in reading activities and other cognitive enterprises of interest to him. Likewise, browsing and book selection lead the child to develop judgment about books and literature, and to develop confidence in his own judgment. (Zirbes, 1961)

Children in IR find many ways to share what they get from their reading. Both individuals and groups prepare presentations, varying from simple to elaborate, to give fellow students their understandings, appreciations, and reactions to what they have read. (Darrow & Allen, 1961, pp. 71-96; NYC, 1960, pp. 45-53)

The teacher also will assist the children in groups which are formed when it is discovered that several children need help in a particular skill or a related group of skills. The group may use a basal reader or workbook for convenience at these group sessions. The group will be disbanded when the particular skill need has been met, though a group may encounter new skill problems and stick together to work on them. Members of the group, when they have mastered the skill(s) being studied, may return to self-chosen reading. In most instances, the child's group participation will be concomitant with his reading of a self-selected book.

As with basal reading, the children may engage in extension and creative activities as part of their reading program. These activities may include reporting on books read, drama, art or construction, and creative writing. (Barbe, 1961, pp. 17-18 and 40; Brogan & Fox, 1961, pp. 144-203; Visit X-5-5)

In summary, IR allows the child to select his own reading materials and to read at his own pace. The teacher works with children in individual conferences to assist them with whatever skills need improvement, and to encourage the children in widening their enjoyment of reading. The teacher also works with groups of students on skill-and interest-building activities. Students communicate with each other in many ways about their reading experiences. This summary will be used as the definition of IR in this study. (C. Carr, 1958, pp. 5-7; Izzo, 1960, pp. 74-80; Stine, 1962, p. 6)

IMPORTANCE OF CREATIVITY AND PROBLEM-SOLVING; DEFINITIONS OF CREATIVITY AND PROBLEM-SOLVING

Most authorities in the field of reading set comprehensive and inclusive goals to be attained, as noted above. Yet some actual teaching programs and the means used in evaluating them are extremely limited, stressing word recognition and some limited comprehension skills. In our world, the requirements of literate citizenship are such that reading instruction should encompass a series of teaching/learning situations appropriate to the demands of this world. Children of today need to be able to use reading for many increasingly complex and comprehensive purposes. (Witty, 1949, p. 11; NEA Project on Instruction, 1963, pp. 124-132; Parker, et al, 1962, pp. v-vi and 71-92)

Interest in having children learn more than vocabulary and such comprehension skills as "the main idea of the paragraph" has been widespread for a long time. The Socratic dialogues remain as classic examples of a teaching process designed to encourage rational thinking, effective consideration of relative values, and coming to conclusions yet leaving the door open to further thinking. In every age since the Reformation and the Renaissance, the need for such comprehensive consideration of data and alternative possibilities for action has been recognized. Specialists in reading instruction have for many years recommended stress on the thinking aspects of reading. (Brinton, 1953, pp. 244-249; NSSE, 1925, pp. 9-19)

Two thinking activities that have attracted a great deal of attention in the last decade are creativity and problem-solving. Although they have been regarded as of considerable importance for a long time, their prominence has increased during the decade 1954 to 1964. (Russell, 1956; Getzels & Jackson, 1962, pp. 77-132)

What is meant by "creativity" and what is meant by "problem-solving"? "Creativity" is defined as the production by the individual of a new or original article, idea, design, or configuration, or one that is new for this person, or that is a substantial revision of one that this person previously may have devised or created, or may have seen. In this sense, creativity may refer to a piece of sculpture, an idea (such as the conception of the hotline between Washington, D. C. and the Kremlin), a design for a new tool or machine, or a configuation of symbolic materials (as, for example, a poem). (C. Taylor, 1964, pp. 6-7; & 159-161; Guilford, 1959; Reyburn, 1963, pp. 11-12)

How will the amount and quality of creative activity of the students participating in this study be measured? This will be done by comparing each child's products with frequency tables prepared by Dr. Martin Covington as a result of his extensive use of the Minnesota Tests of Creativity with students of the same grades as in the present study. (Torrance, 1962, pp. 44-64; Blank & Covington; Crutchfield & Covington, A)

The distinction made by Guilford between convergent thinking and divergent thinking may add to the understanding of the notion of creativity. By convergent thinking, he refers to thinking which seeks a single "right" answer, clings to the known, and agrees with or most closely approaches the thinking of most other people in a culture at a period of time. By divergent thinking, he refers to thinking which moves away from the paths and patterns of thoughts of the culture. It is in this latter sense, of atypical thought, that the term "creative" is used in the present study, and the degree of divergence from the average will be shown by comparing student products with frequency tables. (Guilford, 1959; Taba, 1962, p. 102; Visit C-4-3)

While much is said about the value of creativity, comparatively little is done to foster it in most school classrooms. A major reason for this is uncertainty about "how to do it." A major purpose of the present study is to see if the method used in teaching reading will cause a difference in the creative thinking of children by the end of a full school year. (Taba, 1962, pp. 151-157; Sowards & Scobey, 1961, pp. 372-379) (infra, ch. 4, sec. H.3.)

Problem-solving, the second skill under consideration here, has been defined by Russell as follows:

"A problem is a task which a child can understand but for which he does not have an immediate solution. Problem-solving, accordingly, is the process by which the child goes from the task or problem as he sees it to a solution which, for him, meets the demands of the problem." (Russell, 1956, p. 251)

A prerequisite to problem-solving is comprehension of at least some of the features of the problem faced. This clearly places some limitations on the problems that can be set for solution. For example, an Australian bushman could hardly be expected to comprehend problems involved in the repair of a TV set; problems are culture-related. (G. Murphy, 1958, pp. 47-56; ASCD, 1959A, p. 25)

Children, says Russell, are often asked to deal with a situation which they do not understand, and which he calls a "puzzle." The bushman faced with questions concerning a TV set would be faced with a puzzle. (Russell, 1956, pp. 251-252)

It may be difficult to decide in a given instance whether a child is faced with a "problem" or a "puzzle." In the present study, the problems selected for attempted solution by the children were designed for children of this age, and have had extensive use with 5th and 6th grade students. They deal with problems familiar to people in contemporary America. Based on successful prior usage and on the fact that 27 out of 29 teachers involved in the present study judged them to be of appropriate difficulty, I believe they were problems which these children were capable of understanding, and hence, they appear to fit Russell's definition.[1] (Johnson, 1955, pp. 63-64; Parker et al, 1962, pp. 308-311; Pritzkau, 1959, pp. 16-39)

Children do improve their problem-solving performance through organized programs of teaching. But will the teaching of reading by one method rather than another, without any specific stress on problem-solving, make a difference in student performance on such tasks at the year's end? It is a major purpose of the present study to seek evidence on this question. (Suchman, 1962, pp. 81-82; Glaser, 1941; Weichert, 1961; Katona, 1940, pp. 68-95; Bruner, 1956, pp. 134-142)

1/ The two teachers who felt the problems were too difficult were teaching the lowest ability groups in their respective grades and schools. Many of these children reacted to the creativity and problem-solving tests as though they were puzzles, and it was felt the test scores would be of very doubtful validity. Many of these children expressed surprise that there could be many "right" answers to the test items. Their scores were not included in the analysis of data.

It should be stressed that creativity and problem-solving are closely inter-related. Russell in Children's Thinking points out that in addition to distinctions in conceptual framework and terminology, the scholars concerned with the several thinking skills acknowledge considerable overlap. Bruner in The Process of Education makes much of the relationship between what he calls "analytic thinking" and "intuitive thinking." Wertheimer, in describing the evolution of the theory of relativity as Einstein told him about it, shows several examples of where hunches or guesses or intuitive "stabs," as well as much systematic thinking, contributed to Einstein's eventual success. In the present experiment, the scores on the Torrance tests were used as measures of "creativity" and scores on the Covington tests as measures of "problem-solving." However, I acknowledge the overlap; as evidence, note that the children who scored well on the Torrance tests tended to score well on the Covington tests, so the two performances required in this experiment appear to draw on the same or very similar skills. (See also infra, ch. 4, sec. H.3) (Russell, 1956, p. 27; Bruner, 1960, p. 58; Wertheimer, 1945, Ch. 7)

SEX DIFFERENCES AND READING

Boy-girl differences are among the factors which may contribute to differences in performance on reading tests, and on the tests used in this study. Heilman summarized research findings which show that there are appreciable differences between boys and girls in reading. Girls tend to excel over boys in the primary grades and, by diminishing amounts, in the intermediate grades -- when performance is measured on standardized achievement tests. Comparisons will be made in the present study to see if boys and girls differ in the number of books they read, or in their performance on creativity and problem-solving tasks. This will be a way of finding out whether sex differences previously noted on standardized reading tests and in teacher judgment of children's reading proficiency are also found in performance on creativity and problem-solving tasks. (Heilman, 1961, Ch. 11; Hunnicutt & Iverson, 1958, pp. 119, 125, 154, 433)

NUMBER OF BOOKS READ

How many books do intermediate grade children read in a school year? Up to the present, little dependable research information has been available on this question, especially information gained in a comparative study. Previous reports have given only limited information about, in most cases, small numbers of students. In these reports, appropriate statistical treatment is missing, though Acinapuro includes statistical treatment in his study. This research will report the number of books read by the subjects during the 1963-64 school year. Within treatment groups, boys will be compared with boys, girls with girls, and the totals will also be compared. (Acinapuro, 1959)

SUMMARY

In summary, major points presented in the first chapter are as follows:

1. A number of methods are used in teaching elementary school children to read. Among these are basal reading and individualized reading. The two methods are described.

2. Along with learning word and comprehension skills, children should have opportunities to be creative and to work at solving problems appropriate for their maturity. The major purpose of this study is to find out if one method of teaching reading will make a greater contribution to skill in creativity and problem-solving than the other. Both creativity and problem-solving are defined.

3. This study compares 5th and 6th grade students taught by BR with students taught by IR. The comparisons will be of creative responses, skill in problem-solving, and number of books read. Sex differences in all three variables will be measured. The 5th and 6th grade students who are the subjects in this study took the Torrance and Covington tests in the fall of 1963 and again in the spring of 1964. In between the testing times, the X groups experienced IR while the C groups learned reading by the BR method.

CHAPTER II

REVIEW OF RELATED RESEARCH

Research related to this study divides itself into the following five categories, each of which will be discussed separately.

A. Research on number of books read

B. Writings about IR – reports of teachers' experiences, testimonials, and comments

C. Research comparisons of IR and BR

D. Collateral research

E. Evidence as to the validity of the Torrance and Covington tests

A. Research on Number of Books Read

It has been suggested that the teacher "...should measure the success of the reading program in terms of what and how much the children read." (Yoakam, 1955, p. 275) However, Barbe cautions that, "Quantity alone is not a measure of success." (Barbe, 1961, pp. 56–58) Recent demands on our schools stress the importance of both more and better reading by children, so it appears that both should be encouraged. The immediate concern in this portion of the chapter, however, is with quantity.

A number of books and articles on IR have claimed that children in an IR program read many more books than children in a more conventional BR program. Irene Vite, for example, says that a first grader in this program may read over a hundred books in a school year. In a three-year study with high school students, LaBrant found that a rough average per pupil was seventy books. (Miel, 1958, pp. 20–21; Hunnicutt & Iverson, 1958, pp. 6–9, 125–133, 154–161)

Acinapuro's study provides a good deal of information on the subject of books read. Using matched classes of intermediate grade pupils, he compared various performances of IR and BR classes. He counted as books read only those books withdrawn from the school libraries, though this included a set of 100 books placed in each classroom, with provision for rotation of books during the year. He divided his comparison into books read in class, books read out of class, then combined the numbers for a total. There were three reasons why the present criterion differed from Acinapuro's: (1) this study stressed the building of large classroom libraries; the school library was only of secondary importance (and in many cases was non-existent); (2) withdrawal procedures from a formal library may serve to discourage some students from checking out books; and (3) since all students in this study were encouraged to take books home to read (or bring books from home to read at school), the division into Acinapuro's two categories is less meaningful. (Acinapuro, 1959, pp. 83–84)

Acinapuro's analysis, using the Chi square statistic, demonstrated that the IR students read more books in class than the C students, the probability of a difference of the size found occurring by chance being less than .001. When the two categories were combined, Acinapuro found that the difference showed "...substantial statistical significance in the direction of classes using the individualized pattern." (ibid., pp. 84–87)

Other writers have shown interest in the number of books read. They have discussed experiences at various grade levels and with various numbers of students. For the present purposes, these reports lack three features necessary before one can believe he has a dependable research finding. In the first place, they do not compare the reading of children in IR with children in BR. Second, they provide data on only small numbers of students. Third, they do not show that their data have been analyzed with appropriate statistical instruments. (LaBrant in C. W. Harris, 1960, p. 1125; Rowe & Dornhoefer, 1957; Schwartzberg, 1962; Stine, 1962)

B. Writings about IR (reports of teachers' experiences, testimonials, and comments)

The reports of IR go back many years. An early example is an article by Ray B. Dean, an elementary principal, on the experiences of teachers in Sacramento. To conduct an individualized program, the teacher should first determine each pupil's reading ability level, says Dean. Then the child should be allowed to read a number of books suited to his reading ability. "A wide variety of ungraded books should gradually replace the large sets of supplementary readers which make up materials of the traditional classroom." But the student should not be permitted to go much above or below his level in the books he selects. Teachers restrict the books the child may choose. After reading about fifteen books, he will have raised his reading level to the next higher grade, and when this has been verified by a test, the child may select books from the next higher grade level. The teacher helps the child with unknown words, has each student read to her orally, and may group students for particular teaching tasks. Each child is to keep his own vocabulary notebook on which the teacher may drill him at any time. Dean evaluates by saying that "...more interest and progress is apparent." (Dean, 1938)

Many reports belong in this category. As Russell Stauffer points out, they go back at least to the early 1920's. (Stauffer, 1959) The reports include: Bruce, 1957; Burrows, 1950; Dickinson, 1959; Fowler, 1960; Frazier & Dickinson, 1962; Gates in Hunnicutt & Iverson, 1958, pp. 94-102; Greenman & Kapilian, 1959; Jenkins, 1957; Kenny, 1962' Kingsley, 1958; Lazar, 1957B; Maib, 1952; Newman, 1957; Parkin, 1956; Polansky, 1957; Rowe & Dornhoefer, 1957; Savignano, 1957; Schwartzberg, 1962; Sharpe, 1958; L. Smith & Becker, 1960; Vite in Miel, 1958; Walt, 1958; Whitcomb, 1956; Wilson, 1956; Young, 1957. Two collections of such reports, both quite sympathetic to IR, are the books by Jeannette Veatch and Alice Miel. (Veatch, 1959; Miel, 1958)

These reports have a number of features in common. They describe the experience of one teacher, sometimes several teachers, with IR, and provide parts of a definition of IR. Both Veatch and Miel have comprehensive definitions. (Fowler, 1960; Veatch, 1959; Miel, 1958) Most of the reports are favorable to IR. They would lead one to believe that teachers like IR as a method of teaching reading, though they note some shortcomings as seen by particular teachers. (Wilson, 1956) Children, too, like IR, these reports would indicate. (Schwartzberg, 1962) Most of the reports cover experiences in grades 1, 2, and 3, though some of them cover upper grades. For classroom teachers interested in finding out "how to do it," many of these reports are useful. (Rowe & Dornhoefer, 1957) But, and this is most important from the present point of view, these reports do not use X and C students -- and no comparison of the performance of students learning by contrasting methods is made, with a few exceptions.

A second group of published items on IR are the commentaries, expressing a variety of attitudes, from very favorable to very unfavorable. They include: Allen, 1957; Allen, 1958; Alpert, 1957; Barbe, 1961; Betts, 1961; Botel, 1961; Dickinson, 1959; Dolch, 1961 and 1962; L. Gray, 1963; Hansen, 1962; B. Harris, 1962; Jacobs, 1958; Karlin, 1957;

Lazar, 1957A; Lofthouse, 1962; McCullough & Fox, 1958; Murphy, 1961; Robinson, 1957; Sheldon, 1957; Smith, Krause & Atkinson, 1961; Stauffer, 1959; Veatch, 1957; Veatch, 1960; Veatch, 1961; Witty, 1964; Witty, Coomer & Sizemore, 1959.

These commentaries have a number of common features. They discuss theoretical reasons why IR should or should not work, or practical reasons why IR may be expected or not expected to work, or they cover both. In most instances, they are a reaction to observation of individualized programs, or to some of the other articles that have been written on the subject. They show how deeply emotional investment in ideas and practices can influence one's statements. They show how, starting with different aims for the teaching of reading, and starting from different points of view about child growth and about how learning takes place, one can arrive at quite different expectations of a particular classroom practice. (Veatch, 1960)

Allen reminds teachers that each child must acquire for himself the skills he will need in communicating with others, including the reading skills; the teacher serves as a facilitator of learning. (Allen, 1958) IR, some of these authors claim, digs deeper than BR into the nature of the developing child, and the vital feelings he has about himself and the work he does at school. The initial step -- deciding to try IR -- is the crucial one, and inability to take it has a profound effect on reading and other curriculum innovations. (Beecher Harris, 1962) Lofthouse argues that the evidence favoring IR over BR is questionable and recommends against large-scale change by teachers unless further controlled research reveals its superiority. (Lofthouse, 1962) Some commentators doubt the ability of the ordinary teacher to succeed with IR, and hence believe that IR will be a limited movement. (Smith, Krause & Atkinson, 1961; Sperry, 1961) Writers committed to BR find many faults with IR. (L. Gray, 1963) At the other end of the spectrum, enthusiasts for IR extoll its virtues. (Veatch, 1959)

Increasingly, responsible students of reading tend to take a middle position. (W. Gray, 1960A; Dolch, 1961 and 1962; Sheldon, 1960; Betts, 1961; N. B. Smith, 1963, pp. 129-159) For example, Witty, who has considered the advisability of IR over a period of years, concludes that its capitalization on children's interests, and the value of individual diagnosis of each child's needs outweigh the values of the traditional approach. He advocates the incorporation of some features of IR into a new consensual approach to reading instruction. (Witty, 1962; Witty, 1964)

A valuable aid to any researcher in the field of IR is the collection of brief reviews of a large number of studies, both descriptive and comparative, compiled by Groff. In all, he has done capsule reviews of 94 studies. His reviews tell the most basic facts, such as the students involved and the comparisons made, give the results of the study, and give a complete citation of the original source. (Groff)

C. Research studies: comparisons of IR and BR

The question of systematic vs. opportunistic teaching has been debated for a long time. Essentially, some would say, IR is an opportunistic method of teaching, while BR is clearly systematic. The merits of this argument are worthy of discussion, but not at this point (compare Durrell, 1957, and Strang, et al, 1961, pp. 41-42 vs. Veatch, 1960). Gates and his associates, in a 1926 study featuring comparisons of twenty-five matched pairs on reading age, spelling, arithmetic, and handwriting, found that the systematically-taught students exceeded the gains of the opportunistic students in all subjects except handwriting. On a test of general information, the two groups were equal. While the study did not focus on reading, it has a relationship to the present study because there is a similarity between what Gates designated as "opportunistic" teaching and the definition of IR used here. (Gates, 1958, pp. 94-102)

Helen Field reported her research in 1930. She distinguished between what she called "extensive individualized reading" and "intensive" or class reading. These correspond to individualized reading and basal reading as considered in the present research. Her study involved 62 classes of 2nd, 3rd and 4th grade students in thirteen schools and two public school systems, with rough matching of experimental and control groups. Her comparisons were of high, average, and low IQ groups within the two main groups, and pairs matched as to chronological age, IQ, and grade level. She concluded that the two methods "...are about equally effective in developing reading ability in transition groups in typical public schools." (Field, 1930, quote: p. 49)

Jones, in a study involving five classes on the X (individualized) side and approximately five children per class on the C (conventional group instruction) side, found that the X children gained appreciably more in a school year than did the C's. For total achievement (including reading, arithmetic, and spelling) the X group gained an average of 1.11 years to .87 for the C's, which gave a "t" ratio of 2.678, significant at the 1% level. in reading, the average X gain was .96 years to .73 for the C's. According to her analysis of her data, the average and below average students benefited more from individual instruction than did the above average students. (Jones, 1948)

In the same year, Harold Kaar completed his dissertation evaluating individualized reading and comparing it to basal reading at the 3rd grade level. A strength of his report is that he devotes considerable space to a detailed description of individualized reading as used in the Pittsburg, California schools. One feature of this particular program not reported elsewhere in the literature is fairly extensive use of Fernald's tracing method of trying to fix a new word in the child's memory. Another feature -- one found in a number of reading programs, whether individualized reading or not -- is the use of student helpers, especially to help children who cannot unlock new words they encounter. It should be noted that Kaar's description of IR does not agree with the definition and description of IR used in this study. In my opinion, IR as used in the Kaar study cannot properly be called IR.

Kaar, using students in Martinez, California as a C group, compared student achievement on a standardized achievement test and concluded that the C group achieved more in one year of instruction, especially in reading comprehension.

Three points deserve attention in evaluating Kaar's conclusions: (1) The Martinez schools had completed a reorganization of their reading program several years before the data was gathered, and the Martinez students in grade 3 during the experimental year were in their third consecutive year under this program. The Pittsburg students, on the other hand, were in the first year of the experimental program. (2) The Martinez pupils were tested two months earlier than the Pittsburg pupils, and two months were added to the average scores of the Martinez pupils in vocabulary and comprehension to make the results more comparable. In view of the findings of Bohnhorst & Sellars, and Sartain (infra) that the greatest gains are made in the first 3 months of the school year, the validity of the comparison between Pittsburg and Martinez may be questioned. (3) Class size was distinctly different in the two communities, each Pittsburg teacher having an average of 38 pupils while the Martinez teachers had an average of 28 pupils. (Kaar, 1948)

Irving Anderson and collaborators noticed that primary children in Ann Arbor public schools were scoring better on the Gates Primary Reading tests than were children in the university school. They ruled out IQ as a factor, since the two groups were quite comparable on IQ scores. They settled on the methods of instruction in reading as the cause for different progress. Children in the public school followed the BR method, with careful sequential presentation of skills, while the lab school pupils had a "highly individualized experience. Not content with this conclusion on the basis of student progress in the primary grades, the investigators kept longitudinal records through grade 6. The initial differences were not sustained throughout the period of study; once the university children learned to read successfully, their rate of gain exceeded the public school children, and the two groups ended up about even. Anderson concluded: "It is evident that the difference in method does not have a lasting effect and that reading can be taught successfully either way." The research also indicated that boy-girl differences were not significant. (I. Anderson, et al, 1956)

Clare C. Walker investigated the feasibility of having student teachers teach individualized reading under the supervision of critic teachers. This was at Northern Michigan College, where the 4th, 5th and 6th grade students used as subjects attended the lab school. She returned "...a verdict of no differences in favor of either method." Several points will lead to a more complete picture of Walker's work: (1) the total number of students involved was only 90, a small number considering they were divided into grades 4, 5 and 6 and into X and C classes; (2) the number of books available to the groups appears to have been inadequate by standards estimated in the literature (for example, Veatch, 1960); (3) children in the individualized reading program liked it, and in general preferred it to basal reading; (4) critic teachers split on attitude towards individualized reading, one favoring, one rejecting it, and one would combine some of its features with features of basal reading; (5) student teachers favored individualized reading except for one who preferred a combination approach. (Walker, 1957)

In conjunction with Walker's study, it is appropriate to mention Duker's report since student teachers were involved in it also. Ten prospective elementary teachers who were dissatisfied with basal reading met with Duker and others to learn about individualized reading, and later taught under the direction of regular teachers. Acknowledging the factor of initial enthusiasm for a new method, and the fact that a larger amount of time was allotted to reading by the X (individualized) classes, Duker found a 6-month gain in four months on the Stanford Achievement Test for the X classes while the C classes were achieving only a 2-month gain. Even more enthusiasm for individualized reading by teachers and students was expressed than in the Walker study. (Duker, 1957; Veatch, 1960)

Another experiment at the primary level was done by McChristy. She started with twenty-two 2nd grade classes, four of which were taught by the individualized reading method. From the remaining 18 classes, she found four which most closely matched the X classes (on the criteria of teacher personnel, and socio-economic level of school environment) to serve as C classes. She concluded that there was evidence of "...a definite advantage in favor of the selective reading program." Some more specific findings were: (1) the mean CA for the C group was 91 while the mean CA for the X group was 87 -- a difference significant at the .01 level which may well have had some effect on the outcome; it could be hypothesized that had the X children been chronologically as advanced as the C children, their superiority in reading might have been still greater; (2) at the beginning of the study, 64% of the C students were at or above grade level in reading achievement while 56% of the X children were; at the end, 61% of the C children were and 74% of the X children were; this supports her conclusion that most of the children made good gains in reading regardless of method; (3) her testing was done at the beginning of grade 2 and at the beginning of grade 3 (October in each case). The summer between grade 2 and grade 3 intervened; while it would be hard to say the summer "favors" either method, it would be hard to say that the summer had no influence on the outcome. Some children would read a good deal during the summer, others little or none, and such practice would almost certainly have an effect on the outcome. (McChristy, 1957; Gage, 1963, p. 175)

Acinapuro conducted a piece of research which bears many similarities to the present study, though this study was planned and carried out before the present investigator had read any but very brief reviews of his work. Acinapuro used classes of 4th, 5th and 6th grade students in a suburban New York community, and had one of each pair of classes teach IR while the other taught BR. He held in-service meetings for the teachers involved. A selected list of 100 books was placed in each IR classroom, with rotation of books later according to a plan; the BR rooms each had a minimum of 25 books, and also rotated them. His experiment, like this one, lasted for the full school year. The teachers were selected and paired in a manner similar to procedures used in this investigation. Acinapuro was able to get close matching of class sizes; for example, each of the 4th grade classes had 28 students. Further, in each pair of classes, the number of boys equaled the number of girls. Acinapuro also visited the classes in his study.

To decide which group made the better gains, students took the Iowa Test of Basic Skills and Gray's Standard Reading Paragraphs in the fall and again in the spring. He set .05 as the level of significance. He calculated F ratios, and found significant differences favoring the X classes on silent reading comprehension, total silent reading, and oral reading. On vocabulary, the difference was not significant.

Considering that Acinapuro used careful matching of classes and teachers according to generally recognized criteria, that he defined his methods and spent time overseeing the work of the teachers, that he used multiple measures of reading achievement, and appropriate statistical measures of his results, his study should be recognized as one of the best that has been done in comparing the two methods of teaching reading. (Acinapuro, 1959)

Teachers in Whittier, California used IR for a period of years in the 1950's and kept records of the achievement of their pupils. One class, which had BR in grade 1, had IR from grade 2 through grade 4. For the 26 children in the class continuously through the years, the median gain in reading grade placement on California Achievement Test-Reading was 4.3 years at the beginning of their 5th grade year. Nineteen were at or above grade level, 7 were below grade level, but only one of the 7 was more than one year below. Seventeen of the students were reading above their mental age grade placement, 9 were below and of these, 4 were more than a year above the grade level norm. The author concluded that this meant these children were exceeding expectations for their ability. Another class of 29 children which started IR in January of their grade 1 year achieved a median grade placement of 4.0 on the CAT at the beginning of their 3rd grade year.

This study, instead of using X and C groups, compared students using the X method with the norms for the standardized test. The results, even though based on small groups, do indicate better than average growth for these children and hence the success of IR in teaching these children to read. (Cyrog, 1959)

Two parallel studies, one in Minnesota and one in Atlanta, featured the use of groups of children exposed to both basal reading and individualized reading in successive periods of time in the same school year. The Minnesota research used grade 2 children while the Atlanta experiment used students in grades 1, 2 and 3. In Minnesota, the X students had individualized reading for 56 school days and then had basal reading ("enriched") for the same number of days, while the C group students had basal reading first followed by individualized reading. A battery of Gates tests were used to evaluate student progress. The first conclusion was that the children made their greatest progress in the first three months of the year, regardless of method. At least one of the conclusions favored basal reading. In Atlanta, students had either basal reading from January to March and individualized reading from March to May, or the reverse sequence. Only the top readers in any class were permitted to follow the individualized reading method, a very unfortunate limitation. The Metropolitan Achievement Test and the Durrell-Sullivan test were used to measure student progress. In four of the five groups, the gain was greater for basal reading than for individualized reading. As in the Minnesota study, teachers noted that the greatest gains in all groups were made in the first three-month period.

In both of these experiments, the investigators were cautious about coming to any sweeping conclusions. It seems to me that this caution was certainly appropriate: it is not to be expected that two methods of teaching reading can show their full worth in as short a period as these experiments allowed. Also, the strong probability that all of the grades 2 and 3 students in both experiments had had BR in grade 1 (or grade 1 and grade 2) would give that method a "head start." It has been the writer's experience that many 5th and 6th grade children, used as they are to BR, take a period of time to see the point of IR; even after three or four months, a few could not understand that IR was the reading program in their classes. In the present study several teachers reported that a few students as late as their seventh month of experience with IR were asking, "When are we going to do our work in reading?" (Sartain, 1960, pp. 277-281; Bohnhorst & Sellars, 1959)

An experiment in Los Angeles County used children in grades 3 to 6 as subjects, and tested them on the California Achievement Test in two successive Octobers. The conclusion was that the students in individualized reading did not do very well; only 26% of them gained a full year in achievement during the calendar year while the district norm was 1.25 year's gain per calendar year. As in the McChristy study, the summer between the first and second testing of students is a big question mark, and comparing X children with a district standard is not the same as using a C group. (Safford, 1960)

A New York City study compared the reading scores of 6th grade students who had had individualized reading instruction in grades 4 and 5 with the total population of 6th graders in New York City that year who had not had individualized reading in grade 4 or 5. In this case, the individualized reading students were ahead of the non-individualized reading students by a difference significant beyond the 1% level of confidence on standardized achievement tests. There was careful matching of the final individualized reading sample to make it accurately representative of the city's school population -- as was the comparison group. An interesting point to note here is that this was never conceived as an experiment -- the data were gathered without the possible interference of an in-service training program and an elaborate research system expressly set up for an experiment. Hence, these factors could not contaminate the results. An after-the-fact evaluation avoids the self-consciousness and the extraneous motivating factors unleased in many studies designated in advance as experiments -- and that of course includes the present one. (Aranow, 1961; NYC, 1960, pp. 132-135; Cook, 1962)

Frederic R. Walker, in three heterogeneously grouped 7th grades, studied three methods: (1) an individual help system for each student; (2) Science Research Associates reading lab; (3) single text and workbook. The first group, which he called individualized gained more in vocabulary than the other two, the gain being just short of significance at the .05 level. When the lower halves of each class were compared, the first two groups did achieve gains significant at .05. However, six weeks is a very short experimental period. (F. Walker, 1961)

Carline set out to find if teacher performance and pupil achievement were related. Scales used to evaluate teacher attitudes and observation forms used to evaluate performance were constructed by Lyman Hunt, while pupil progress was measured by the California Achievement Test and the Iowa Test of Basic Skills. The degree of individualization teachers believed in and the achievement of their pupils were not significantly correlated; the same finding covered the relationship of teacher self-reports (and outside observer reports) to pupil achievement. But Carline found that the three measures of teachers were positively related at beyond the .01 level. Carline decided, on the basis of analysis of observations of the teachers, that only a few of those supposed to teach IR had actually done so. He also compared reading achievement of students in 11 rooms judged to be most completely IR with the 11 rooms judged to be most wholly BR. No significant difference appeared. (Carline, 1960)

Braidford and Izzo conducted companion studies in the 1st grades of the Great Neck, New York schools. Izzo compared IR with BR students on word identification skills, while Braidford did the same for comprehension skills. Both studies ran for a full school year. Izzo, using the vocabulary section of the CAT as an interior measure, concluded that the two methods did not differ significantly in effectiveness. Further analyses yielded the fact that the C students did better on phonetic analyses while the X group equalled the C group on word form, meaning of opposites, and picture association. Sex differences between X and C were negligible. Braidford's results turned out to be similar. Her main conclusion was of no significant difference between X and C. But she noted some sex differences: the C boys exceeded the X boys by a significant margin, while the X girls exceeded the C girls by a slight margin. She discounted the superiority of the C boys since their mental ability also exceeded the X boys' mental ability by a significant amount. Older children in both X and C groups made better progress than younger ones. Perhaps the most important outcome of the two studies was the reassurance it gave teachers: students can have IR for a year, even the crucial 1st grade year, and do just about as well on conventional measures of achievement as do BR students. (Izzo, 1960; Braidford, 1959)

Stine studied the reading of 7th and 8th grade students all taught by one teacher. After pre-tests, the students were divided into equated pairs, and one member of each pair was taught by BR and the other by IR. However, he points out that the reading programs only affected between 45 and 90 minutes out of 1800 minutes per week the child spent in school. On vocabulary gains and comprehension, there turned out to be no overall difference between X and C. On Pond's Reading Inventory, "t" scores for the X group showed a significant advantage over the controls, but this proved to be the only notable difference. No significant differences showed up on Smith's Self-Analysis Test or Strang's Incomplete Sentences Test, or on Reading Design tabulations. The result on these three measures occurred in spite of the fact the X students had access to the school library during class time, but the controls did not. Stine explains the results by saying that children who have had 7 years of one type of reading instruction cannot quickly change over to another method. (Stine, 1962)

D. Collateral Research

In this section, creditable pieces of research related to the problems under discussion but not of central importance, will be discussed.

Carr performed several jobs useful to other researchers in the reading field. She compiled a set of principles for a reading program based on child development and human learning as she interpreted them in 1958. She analyzed the work of six well-known authorities on the teaching of reading, with especial reference to their views on IR. Another feature of her dissertation was an observation of over 20 teachers in grades 2, 3 and 4 in the Middle Atlantic states who were reported to be using IR. She concluded, as did Leland Jacobs, that IR is not a "thing" -- not a simply-described patent formula for reading -- but rather a complex interactive experience worked out by different teachers in different ways. (Carr, 1958; Miel, 1958, B. Parker, 1962)

A study devoted to patterns of reading instruction in primary grades was completed by Florence Sperry in 1961. She devised a questionnaire and had it answered by 42 reading specialists and/or administrators in Southern California and by 30 reading instruction specialists in other parts of the U.S. On the basis of their responses, she constructed a scale to show the instructional orientation of elementary school teachers. The 145 teachers of grades 1, 2 and 3 to whom this scale was administered each received two scores, an IR score, and a BR score, and then the two scores were converted into an Index of Instructional Bias. Data on the students of these teachers were then analyzed according to IQ, socio-economic status, and reading achievement. Thus, Sperry, like Aranow, avoided introducing the Hawthorne effect. Sperry asked: did the apparent pattern of teaching in the classroom make a difference in the reading achievement of the child? Yes, "a significant hierarchy of achievement was observed. The individualized pattern was definitely superior to the other two patterns, the unclassified being superior to the basal pattern." Sperry also concluded that "experienced" teachers as well as notably superior teachers could teach IR. (Cook, 1962; Sperry, 1961)

A study with a number of similarities to Sperry's was Lane's. Fifty-nine teachers in grades 1 through 6 volunteered to teach one of three specified methods of reading instruction: the basal, individualized reading, and "the language experience approach." (Allen & Halvorsen, 1961) Each teacher participated in an in-service training program to better learn how to teach the reading program of his choice. The California Reading Test, the California Test of Personality, and an inventory of pupil attitude toward reading (San Diego Inventory, 1961) were given to students in September, January and May of one school year. Conclusions include the following: (1) the in-service experiences were judged helpful by the teachers; (2) students made average gains in excess of twelve months' progress in eight months, leading to the conclusion that such programs help students progress; (3) no one of the methods of reading instruction appears to have demonstrated superiority in this study; (4) students with high achievement in reading tend also to have high personal/social adjustment and, to a lesser extent, to have favorable attitudes toward reading. (Lane, 1963)

Is there a relationship between personality traits of teachers, social climate in their classrooms during reading period, and the approach they use to reading instruction? This was the question asked by Hoihjelle in her dissertation based on research in San Diego County, as was Lane's. The particular personality traits considered were those related to creativity. She concluded: (1) no significant relationship exists between the six personality traits studied and the social climate as measured, or to the approach to reading used by the teacher; (2) however, a relationship does exist between social climate and method of reading instruction. Specifically, teachers who used the "language-experience" approach to reading had significantly higher scores on the Wrightstone Pupil-Teacher Rapport Scale (modified) than did the individualized reading or basal reading teachers. A statistically significant difference was also found between the BR and the IR teachers, with the IR teachers having the higher mean. (Hoihjelle, 1961; Lee & Allen, 1963)

Wollner studied the voluntary reading of 8th grade students at the Horace Mann-Lincoln School of Teacher's College, Columbia University. She stressed: (1) pleasant early experiences with reading seemed the best predictor of later enjoyment of voluntary reading; (2) the dynamic quality of the development of each child's attitudes toward reading; (3) the "individuality of the voluntary reading program... no two children had exactly the same patterns"; and (4) the child's self-rating of his interest in reading had the highest correlation with other measures used (oral reading, questionnaires, Iowa Silent Reading Test). (Wollner, 1949)

Another segment of collateral research consists of studies devoted to bibliotherapy: the use of reading as a means of helping children with personal emotional problems.

IR, or what is called IR, has been used in attempts to retrieve retarded readers, or to bolster the morale of discouraged students. Galotto, in a 1960 study, matched two groups of adolescent boys who were retarded at least one year in reading, and who had either behavioral or emotional problems. One group received what he called "individual reading therapy," and the other "group reading therapy." The groups received treatment as follows:

Group I	Group II	Period of Treatment
5 students	5 students	November - March
5 students	5 students	March - June

He used the WISC, the CAT reading, and the Haggerty-Olson-Wickman Behavior Rating Scale to measure student abilities and gains. In reading achievement and "social adjustment" he concluded that the subjects who had experienced the group reading therapy made greater improvement than the others.

There are a number of faults with Galotto's study:

1. He only defines certain terms used, and his definitions are quite inadequate.

2. The number of subjects, divided as they are into groups of five, seem a very small sample on which to base any conclusions.

3. Most important of all as far as the present study is concerned is the fact that what Galotto calls "individual therapy" has only very slight similarities to IR as discussed in the present study. What he calls "individual reading therapy" is therapy, but, according to the summary of a single session he reports as representative, it is a kind of counseling or psychotherapy in which reading is only peripheral. In fact, there is almost no mention of reading or reading activities or skills in the session. (Galotto, 1960; example referred to is found on p. 89)

Two 6th grade classes at the campus school in Geneseo, N. Y. participated in a one-year study of the effects of individual vs. group bibliotherapy. Individual bibliotherapy consisted of individual discussion with each child to focus on the main problem or problems of each, selection of a book designed to shed light on this problem, and conferences with the child to relate the reading to the problem. Group bibliotherapy differed in that the whole class decided on problems, selected and read related books, and shared the findings of the best books by means of panel discussions. On the Stanford Achievement Test, the C group class gained 17 months while the X class (I) gained 9 months, but this did not reach significance at .05. On the California Test of Personality, the X class lost in two areas while the C class made no appreciable gains or losses. Most of the differences between X and C classes were slight. The study concluded that books can help children with personal problems. (Mattera, 1961; Weingarten, 1954)

E. Evidence as to the validity of the Torrance and Covington tests

Do the tests used in this experiment measure what they purport to measure? In human experiments, only in cases in which physiologic functions are measured can we be "sure" we are measuring what we want to measure. Even some of these are subject to doubt: for example, the lie detector test checks several physiologic reactions to questions asked of the subject. But a number of qualified people question the validity of the results of the lie detector. Bridgman says an individual is always the observer of the evidence, and, as in any kind of test, he is always subject to self-doubt, and there is no real answer to self-doubt. (Bridgman, 1959, pp. 63 and 77)

Torrance, seeking instruments with which to measure the range of creative abilities of children, scanned the literature for clues: the child growth and development field, the gifted child field, and the studies of creativity in adults. He also looked at the writings on teaching which had discussed creativity and its cultivation. (Torrance, 1962, pp. 255-270) In 1958, soon after beginning work with his associates in the Bureau of Educational Research at the University of Minnesota, he adapted some of the materials devised by Guilford: Unusual Uses, Impossibilities, Improvements, and others. At the same time, other ideas were tried out. "An attempt was made to construct tasks which would be models of the creative process, each requiring several types of thinking. This approach represents a departure from that of Guilford and his associates. Perhaps the greatest divergence is from Guilford's insistence that predictor measures should represent single factors.... The Bureau's program has been to develop complex tasks presumed to involve the creative process and then to examine the products for evidences of various types of thinking, or, to use Guilford's term, factors. A calculated attempt has also been made to develop tasks which will grip the interest of the subject and which will permit him to 'regress in the service of the ego' which appears to be important in creative thinking." (ibid., pp. 44-45)

The creativity items used in this experiment are of two types. The "circles" and its counterpart the "squares" require the child to draw and label as many real items as he can using the square or the circle as a basic visual element of each item. Many students put a peaked roof on one of the squares and label it a house, for example. Successful performance requires some visual ability, and some ability to notice the world around one, and measures fluency of the flow of ideas, and especially the speed with which the subject is able to get his ideas on paper. The "toy dog" and its correspondent, the "toy truck" are called "product improvement" items. The child sees a picture of the named object and is asked to think of ways in which it could be made more fun to play with. Such ideas as real electric lights for the toy truck appear as frequent suggestions. (Torrance, 1963, pp. 21-39) Since these items are considered by Torrance to be equivalents, one of each pair was administered in the fall and the other in the spring. Scoring is the same for the two tests, so differences between fall and spring scores can be used to show the student's gain or loss in these aspects of creativity. (Appendix 9)

A number of these tests have been used with large numbers of students the same ages and grades as those in this experiment. Torrance says that, in addition to discriminating between groups of creative older students and adults, and non-creative ones, these tests distinguish the creative from the non-creative child in elementary school. This validation of younger students was in terms of observed behavior in small group situations, on the basis of peer and teacher nominations, and on the basis of achievement on standardized tests. In the latter case, Torrance showed, as Getzels and Jackson had done, that students with high IQ's and/or high achievement scores do not necessarily score higher on the tests of creativity. Torrance interprets this to mean that the creativity tests do measure different aspects of the human intellect in action. He notes, also, that a number of the high creatives do achieve quite respectable grades in school or college. This is confirmed by the evidence that tests of creativity predict achievement at least as well as standardized tests of scholastic ability. Torrance's findings on the creativity of those nominated by their peers have been verified by the work of MacKinnon, Barron and others at the Institute of Personality Assessment and Research. (Torrance, 1962, pp. 47-64; Torrance, 1963; Appendix A; Getzels & Jackson, 1962, pp. 15-28; MacKinnon, 1960; Barron, 1963)

Granted that the evidences of validity offered by Torrance are limited, they are fairly consistent and persuasive. Also, they agree with the findings of other researchers. It is my belief that the Torrance tests measure aspects of what, for want of more exact terms or categories, has been called "creativity." (supra, p. 5)

Much the same things may be said on behalf of the validity of the Covington tests. Martin Covington, since completing his doctorate in education, has worked with Richard Crutchfield and others in the Psychology Department of the University of California. His effort has been parallel with Torrance's: the development and refinement of instruments for measuring the abilities of people, especially school children, to solve verbal problems. He acknowledges the influence of other thinkers on his work. As an example, his "X-ray" problem is an adaptation of a problem used by Duncker with college students. (Duncker, 1945) Each problem presents the subject with a set of facts and a simple picture or pictures portraying the setting. While there are definite limits set, the subject may respond in a number of ways. At any time, the subject may look back at previous pages of the booklet; he may not look ahead until told to do so. (Appendix 9)

Covington belongs in the succession of psychologists who have supported the view that, for most people, in most situations, a problem will be solved in stages or steps, rather than by a single flash of insight. Covington takes this one step further by breaking down his problem, after initially stating it, into a series of steps which the subject can take. This does not preclude the "Eureka" phenomenon; the subject may write his solution or solutions to the problem on any page, and is coaxed to do so. Repeated or rewritten items of information and new drawings of specific aspects of the story are followed by questions, either restatements of the original problem, or questions designed to focus the subject's attention on a specific aspect. (Durkin, 1937; Dewey, 1933; Katona, 1940; Bruner, Goodnow & Austin, 1956, pp. 231-246)

Covington agrees in part with Suchman on the relationship of question-asking and problem-solving. The "X-ray" problem, for example, asks the student first to write down all the questions he would like to ask after the first presentation of the facts.

Another way in which the student's attention is focused on the problem is by asking him to say which of several statements (presented as a multiple choice) most accurately states the problem the student is trying to solve. Such a page appears in the "X-ray" problem. In the "Elevator" problem, Covington asks that the student state the problem he is trying to solve; this is on page 5 after the story has been presented, and after several pages on which the student could suggest solutions. In the "X-ray" booklet, two of the devices mentioned above -- repetition and restructuring -- are used to aid the student in appreciating possibilities for solutions. Page 4 takes the subject on an apparent detour, which is in reality a clue presented in a different form, both verbally and visually. Page 5 introduces what appears to be a complete irrelevancy, but is in fact a visual clue presented in a form different from the original.

In all instances, Covington has an elegant solution in mind. In the "X-ray" problem, for example, there are three separate, though related, elegant solutions. (Crutchfield & Covington, 1965)

Covington and Blank used a series of these problems in a brief summer session experiment. After the X children had gone through nine 45-minute sessions working on the problems in an auto-instructional form designed to stimulate the asking of questions that would be helpful in reaching a solution, they were compared with a C-1 group which had an emasculated version of the program and a C-2 group which had no program. The emasculated version left out the questions and "flattened" the stimulii to question-asking. The

X students exceeded both the other groups on question-asking, a science test, and participation in discussion. In an oblique way, this seems to establish the validity of the Covington tests: it shows their usefulness in inducing the asking of relevant questions. If we then agree with Covington and Suchman on the fundamental importance of question-asking to solution-getting, it appears the items have some degree of validity. (Blank &Covington)

Crutchfield and Covington reported another related study to the American Association for the Advancement of Science. Ninety-eight 5th and 6th grade students were matched with ninety-seven controls. The X children had a 13-lesson auto-instruction program featuring detective stories as a vehicle for encouraging problem-solving behaviors. A feature of this auto-instruction program related to IR was self-pacing; each child worked at his own speed. (Crutchfield & Covington, 1963) The "X-ray" problem was one of the criterion measures, Torrance's "circles" being the other. The X children scored higher on the post-tests than did the C's: over three times as many got an elegant solution, and over twice as many "quality" ideas on the "X-ray" problem. Five months later, and without any intervening experience with this type of problem-solving, the X children showed "a clear continuing superiority of the previously trained child over the C children." (ibid.) Though Crutchfield and Covington claim only that their experiment shows that such a program can produce "sensitization" to the use of skills already possessed, it seems that they have established a relationship to problem-solving. If one sets up a problem, thinks of one or more elegant solutions, then tries a group of students on the problem, allowing partial credit for other relevant suggestions, it seems fair to say one is testing a form of problem-solving ability. (Weichert, 1961; D. M. Johnson, 1955, pp. 259-260; Crutchfield & Covington, 1963)

Based on the success of the Blank and Covington study, Covington and Crutchfield undertook a further study in 1964. Again they used auto-instructional materials for the X classes. And again, after sixteen lessons, the X students made markedly better gains on the criterion tests. These tests included the "X-ray" problem used in the present study. The results support the view that the tests measure aspects of problem-solving skill that can be understood and utilized by 5th and 6th grade students in our culture, and that training may lead to improved use of these skills. (Covington & Crutchfield)

SUMMARY

Conclusions that may be drawn from the research read:

1. More research should be done to find out how many books students read in a school year.

2. In the large number of reports and commentaries on IR, a wide range of opinions is to be found. While some of them display teacher and student enthusiasm for this method, others point out what to the authors are notable shortcomings.

A number of respected experts in the field of reading instruction have adopted moderate positions, and have advocated incorporation of some IR features into BR programs.

3. One way to summarize the comparative studies is to compile a "box score," as several commentators have done. (Sartain, 1961; Vite, 1961; G. & R. Fox, 1964) Here is a box score of studies previously discussed in this chapter:

Studies which conclude that BR is superior

	Basis of Comparison
Kaar, 1948	Progressive Ach. Test - Reading
Sartain, 1960	"Slower" students - Gates Primary Tests of Word Recog. & Paragraph Reading "Average" & "faster" students - Gates Advanced Primary Tests All students - Developmental Rdg. Tests - Word Elements & Letter Sounds
Bohnhorst & Sellars, 1959	Metropolitan Ach. Test, Durrell-Sullivan
Safford, 1960	Calif. Ach. Test - Reading

Studies which conclude that differences are slight and do not favor either method

Field, 1930	Gr. 2 - Haggerty Reading Exam. Gr. 3) 4) - Stanford Ach. Test - Reading
I. Anderson, 1956	Stanford Ach. Test, Calif. Ach. Test, Reading
C. Walker, 1957	Cte. on Diagnostic Rdg. Test
Carline, 1960	Calif. Ach. Test-Rdg., Iowa Test of Basic Skills
Braidford, 1959	Calif. Ach. Test-Rdg.
Izzo, 1960	Calif. Ach. Test-Rdg.
Stine, 1962	Calif. Ach. Test-Rdg., Pond's Rdg. Inventory, Smith's Self-Analysis Test, Strang's Incomplete Sentence Test, A Rdg. Design

Studies which conclude that IR is superior

Jones, 1948	Stanford Ach. Test, Gates Basic Rdg.
Duker, 1957	Stanford Ach. Test
McChristry, 1957	Calif. Ach. Test
F. Walker, 1961	Diagnostic Rdg. Tests, Survey Sec. Lower Level
Aranow, 1961	Metropolitan Ach. Test
Acinapuro, 1959	Iowa Test of Basic Skills, Gray's Standard Rdg. Paragraphs

One can conclude nothing from this tally except that a number of respectable researchers have tackled the problem, and their results have differed.

4. A number of collateral studies are concerned with principles for a reading program, patterns of teacher attitudes toward the teaching of reading, in-service programs and social climate in the classroom, and their relationship to success in teaching, and studies of bibliotherapy. None of them appear to provide conclusive evidence bearing on the problems in the present study.

5. On the basis of studies done by Torrance, and by Covington and associates, it is concluded that the Torrance creativity tests and the Covington problem-solving tests measure creativity and problem-solving as defined in this study.

CHAPTER III

RATIONALE OF THIS STUDY: WHY STUDENTS IN AN INDIVIDUALIZED READING PROGRAM COULD BE EXPECTED TO PERFORM BETTER THAN BASAL READING STUDENTS ON THE EVALUATIVE CRITERIA EMPLOYED IN THIS STUDY

In a way, this chapter is an extension of Chapter II, although the material covered differs from that in Chapter II in two respects. While Chapter II deals almost entirely with individualized reading, and with comparisons between IR and BR, Chapter III deals with relationships between IR, on the one hand, and creativity and problem-solving on the other. And while Chapter II is an "objective" discussion of the research, Chapter III presents a point of view with supporting evidence. According to that point of view, there are a number of reasons for believing that the psychological situation in which the child finds himself in IR will make a greater contribution than will BR to successful scoring on the creativity and problem-solving tests.

Education is opening doors ... and helping children to open doors for themselves. In the last analysis, education is a personal and individual matter. Learning is something which the individual does, though of course there are many ways in which others may help. This idea will have an important relationship to all of the points made in this chapter. (V. Anderson, 1964, p. 363; NSSE, 1962, pp. 294-295; Zirbes, 1928, p. 25)

The arguments in this chapter will be presented in a series of points. Each point, with the exception of the last one, will deal with a significant psychological aspect of the relationship between the child and his reading. The point of view to be presented will be a combination of the ideas of the "liberal" curriculum people, represented especially well by the Association for Supervision and Curriculum Development, and the hypotheses and findings of Bruner and others interested in thinking, problem-solving, and creativity.

Point 1: What is available for children to read:

A third-grade boy in Redding, California read a volume of the encyclopedia for three consecutive weeks. In the IR program in which he worked, the encyclopedia was available to him. "Available" in this case means two things: the book was physically available, and it was psychologically available. The child made his own choice among the books in the room, and the teacher accepted it. (Pritzkau, 1959, p. 170; Visit X-3-1)

It is an aim of IR to afford children opportunities for what Betts calls "extensive" reading. Teacher and student attitude toward books and their utilization moves in the direction of greater flexibility in usage. Teachers come to recognize that the child's reading of a book for pure enjoyment may be of great benefit to him in improving his functional skills in reading, in broadening his horizons, and in stimulating his imagination. Increased awareness and personalized thinking may contribute to better ability to deal with creativity and problem-solving tasks. (Betts, 1950, pp. 546-547; ASCD, 1964, pp. 162-168; Lee & Allen, 1963, pp. 76-77)

Hausman cites "the diversity of ways" in which creative people perform and cites "deriving significance from experience" as being a relevant factor. (Gage, 1963, pp. 1107-1108) Rayburn found that experience with activities thought to be related to creativity led to better performance on the Torrance tests of creativity. Suchman, in his work in the "inquiry training" program, has shown that opportunity to work with problems in the area of physics contributes to the development of successful problem-solving strategies. When BR is taught as, for example, David Russell and William Sheldon advocate, and as was recommended to the teachers using BR in this study, the child has multiple opportunities for extensive reading. In this case, books are available to the BR child in the same sense that they are to the IR children given as examples above. It would, under those circumstances, be my expectation that the BR child would equal or almost equal the IR student in creativity and problem-solving. It has been my observation, however, that very few teachers, either in this study or in other school situations, utilize the great potential of BR. (Reyburn, 1963; Suchman, 1960; Russell, 1961, pp. 505-507; Sheldon, 1960)

Point 2: What does the child read in the classroom reading program?

In most BR systems, most of what the child reads is prescribed by the teacher. Students read a story silently, re-read for particular purposes, do vocabulary/word analysis/dictionary work, oral reading, and written work on teacher-made exercises or in a workbook. Only after a number of these activities have been completed is the student free to read a library book, a book he may or may not have selected independently. Some conscientious teachers, fearful that time not spent in a prescribed manner will not result in formal learning, set extra assignments for those who finish "all their work"; this does little to encourage the faster-moving or more imaginative children to finish both quickly and thoroughly in order to be free to read what they choose. (Yoakam, 1955, p. 275)

The rapid expansion in the years since 1950 of the quantity of printed materials specifically prepared for children makes possible richer and more varied programs than those largely restricted to the developmental reading series. Paperback books, many of them equal in quality to hardbacks, have generated a breakthrough in the field of children's literature. Even comics add to the supply of reading material.

In an IR system, most of the time the child reads what he enjoys, what seems important to him. He has many opportunities to browse among books. The child with many books at home and the child who makes frequent trips to the public library will get such experience. These children are a very small minority of those attending most schools. It is important that all children be given the chance to learn the skills of book selection -- and IR offers such a chance. (ASCD, 1959A, p. 63; Karlin, 1962)

The IR plan encourages the child to go further with an idea or line of inquiry that "gets under his skin." So he, more often than the child in BR, may be expected to use the public library to get more books, providing a library is available.

Self-selection also helps the child improve his basic reading skills. This refers to the "bread and butter" skills of word recognition, vocabulary building, and noting main points and details in what is read. The IR student has a heightened interest in finding out answers from his reading; hence functional, directly serviceable learning takes place. New vocabulary is acquired, and new abilities to interpret the printed page are mastered by the child. (Coleman & Jungeblut, 1961; Lyman Hunt, 1961; Niles, 1963)

The child with experiences of freedom of choice of reading material, with increased skill and confidence in book selection, and with the experience of having pursued a line of inquiry for a period of time is more likely to acquire characteristics that will be helpful in successful response to creativity and problem-solving tests. IR helps the child to accept the fact that there may be available no wholly satisfactory answer to a problem. The child may learn to utilize the information available, to persist in the face of uncertainty, and to put an answer or answers on paper in spite of a recognition of their imperfections. A very significant characteristic of the tests used in this study is that there are often a number of appropriate answers. (Appendix 9; Bruner, 1960; Adler, 1958, pp. 86-90)

Does experience with a process lead to better performance of that process? In an experiment by Blank and Covington, children with practice in asking questions to get needed information asked significantly more questions than control groups on post-tests. Durkin's work led her to the conclusion that experience and exploration aid in solving problems. In a combination study considering creativity and problem-solving, Parnes and Meadow found that experience yielded increments in quality as well as quantity of ideas produced. (Blank & Covington, 1964; Durkin, 1961; Parnes & Meadow, 1959)

Evidence supports the view that experience does lead to improved creativity and problem-solving performance. What the child reads makes a notable contribution to his experience. (B. Parker, 1962; DeBoer, 1963; Duncker, 1945; Myers & Torrance Teachers' Manual, 1961)

Point 3: How does the child read?

In a BR group, the child may easily become self-conscious about being assigned to a particular group or about his oral reading. In many cases the BR teacher follows a routine which has been described as "barber shop" or "cafeteria style" reading, in which each child reads a paragraph or page in turn. The teacher must beware of causing self-consciousness because of delayed speech development, articulatory disorders, rhythmic problems, voice difficulties, symbolic disorders (or aphasias), or perceptual problems. Some research links these problems with reading problems, and the problems will be most obvious and embarrassing in oral reading situations. By contrast, the IR student reads to his teacher in a relatively sheltered situation -- no one to squirm if he stumbles, no one to resent his fluency. When the IR child is to read for an audience -- be it a group or the whole class - he prepares for this event ahead of time. (NYC, 1960, pp. 28-33 and 70-71; Kirk & McCarthy, 1961)

Zeal for reading comes from involvement in the search for personal meaning. "When helpful personal meaning is present, the reward for effort is satisfaction received through the activity itself, through its contribution-potential, through realization of personal purpose." (ASCD, 1964, p. 95; W. Gray, 1957) The child, wrapped up in his own search and discovery activities, learns to shut out distractions, forget self-consciousness, and truly concentrate on reading. All too often, this intensity of interest is not found in BR classrooms. (Durrell, 1956, pp. 136-140; Darrow & Allen, 1961, pp. 1-5)

Both creativity and problem-solving benefit from committed effort which overcomes self-consciousness and focuses on learning for its own sake. (Gage, 1963, pp. 1037-1040; Smith & Dechant, 1961, p. 334; Taylor, 1964, pp. 93-95; Russell, 1956, pp. 273-279 and 374-376)

Point 4: When and for what purposes does the child read?

An important goal of reading instruction is the "development of the ability to judge when needs can be satisfied through reading. This goal is reached by developing reading interests; by providing information on sources of facts and fiction; by acquiring facility in the use of other learning aids; and by a clear statement of the purposes of a given activity. After all, reading is only one aid to learning and pupils must acquire judgment which will permit them to decide upon appropriate sources of information." (Betts, 1950, p. 88)

As has been emphasized in previous sections of this chapter, the child in a BR program has most of his reading material and his reading activities prescribed for him by the teacher (Carline, 1960, p. 11) If this is so, the skills mentioned by Betts will need to be learned in other periods of the school day, such as social studies. In the IR program, however, children will constantly be practicing the skills required in finding answers to problems of immediate interest to them. (Hildreth, 1962)

"Read," in the context here, means to be absorbed in reading -- as when the child uses reading as a means of finding answers of immediate interest to himself. IR, because the reading period for many children is an uninterrupted time for reading, makes this type of reading possible ... at least, more frequently than with BR. In too many instances the teacher of BR shifts activities two, three or four times in a given reading period. Also, much of the teacher's evaluation of the child's success in reading is done by listening to the child's oral reading. These factors militate against absorption in reading. (Visit C-6-2)

Active exploration of aspects of his environment is an important part of the child's action toward creativity. As the child becomes involved with data in or related to a problem, he improves the likelihood of achieving a solution. Russell, in discussing the development of creative thinking in children, emphasizes the importance of involvement with the appropriate materials. (Fleming, 1963, pp. 43-46; NSSE, 1961, pp. 107-108; Russell, 1956, pp. 316-319)

The child who learns to read when he knows it will be the best means of accomplishing an immediate purpose of importance to him, and who explores a variety of materials in print, will tend to have the "prepared" mind which can cope with problem-solving and creativity tasks. The child who reads for his own purposes reads single-mindedly. Truly, he gets something from his reading. But while he is deeply absorbed in collecting data about Greek life, for example, he is unlikely to be fascinated in the same way about other topics simultaneously. The teacher who wishes to stimulate creative and problem-solving activities of children must learn to respect the child's judgment, and many times, to stand aside so that the child may have freedom. Children do have a sense of the appropriate time to turn to reading for intellectual and spiritual nourishment. Gates asserts that children show competence to steer their own course, probably better than we have previously believed. (Bruner, 1960, pp. 47-51 and 56-58; V. Anderson, et al, 1964, p. 363; Burrows, 1952, pp. 187-188)

Point 5: At what speeds does the child read?

A strong instructional program in reading "...promotes the pupil's ability to select reading techniques appropriate to his purpose." (Betts, 1950, p. 86) This highlights the importance of readiness on the child's part to adjust his reading to the needs of each particular reading job, whether it be silent or oral reading. Teachers recognize the importance of the child's learning to read at several speeds for several types of reading, though many observers note that these skills may be slighted in the reading program. (A. J. Harris, 1963, p. 391)

Most of the child's oral reading in an individualized plan will be in private. When he reads for the teacher, especially as he becomes used to doing so, he will read naturally and without strain. Since the teacher frequently asks the child to read his favorite passage from a book or story, he will read a passage which has intrinsic interest for him and which he has read silently to himself. When the child reads orally in an IR group, it is likely to be either in a skill-building group concentrating on common skill needs, or else in a reporting activity when the child will have had opportunity to prepare ahead of time. The oral reading in the skill-building group may well be similar, psychologically, to the situation in a BR group and, since the atmosphere at the time of a reporting activity depends so greatly on the teacher's personality and "style," it may be as good in a BR situation as in an IR class. (Veatch, mimeo)

The crucial difference remains, however; the BR child may see oral reading in his group as either a stress situation (because of embarrassment or awareness that the teacher grades his oral reading) or a boring routine; the IR student reading to the teacher in private has a greater likelihood of finding this a fulfilling experience.

Silent reading, too, differs for children in the two programs. In a BR classroom, "group-wise" students adjust their speed to the teacher's expectations, or to the teacher's routine for rotating her work with the groups. When a story is assigned for initial reading, or re-reading, answering "thought" questions on a story, or completing ditto sheets or workbook pages, the individual's speed differs from that of others. But in a "free" or recreational reading period, of course, the child may read at his own pace. (N. B. Smith, 1963, pp. 112-113)

IR allows the child to learn a great deal about speeds of reading on his own. The third grade boy (supra) who read the encyclopedia found out for himself that selections compacted for brevity have a high "density" and hence are relatively slow going. Many teachers report that children in IR choose to vary their "diet" by interspersing easy-to-read books with other reading material. (Maib, 1952; Veatch, 1959, pp. 61-88)

Betts calls for systematic instruction in skimming, rapid reading, and study-type reading. Developers of the teachers' manuals for BR series advocate this, too. But in many instances, actual practices in the classroom support the "lockstep" which inhibits learning the variety of skills and flexibilities needed by readers in the modern world. When properly taught, either IR or BR can promote learning of different reading speeds, and flexibility in adjusting to the requirements of any particular selection. However, IR gives the individual greater opportunity to assimilate these skills for himself. As Yoakam says, "Reading should always be taught from a functional point of view in the pursuit of purposes which are real to the children and not as a formal exercise divorced from its use in satisfying interests and needs." (Betts, 1950, pp. 85-86; Sharpe, 1958; Yoakam, 1955, p. 273; Spencer, 1953, pp. 143-148)

"Pacing of instruction and interest in learning are closely related. In spite of what teachers want children to learn, a particular child may involuntarily, even unconsciously, move away from what-is-to-be-learned unless he wills to learn it and can grasp hold of it." (Darrow & Howes, p. 4)

The creativity and problem-solving measures used in this study have a relationship to speed and flexibility in adapting reading skills. With each test, the student has a time limit, and a number of words to be read. The student must understand the directions, and quickly begin thinking of appropriate responses, whether drawings, written questions, or written solutions are called for. This requires re-reading at appropriate rates of speed, and adapting the reading/thinking/production pattern to the particular test item. The child who excels in the adaptive skills of reading, the child who can shift speeds quickly and frequently in dealing with complex data, should be able to handle the creativity and problem-solving tests better than a child with a more conventional repertoire of word-unlocking and comprehension skills. It is my belief that more children with experience in IR will develop the varied speeds helpful in dealing with the data in the tests than will their counterparts in BR programs. (Taylor, 1964, pp. 84-85; Wenzel, 1964; Hughes, 1964; Sears, 1964)

Johnson, in discussing reaction time, notes that a subject may respond to a stimulus situation in any of a wide number of ways, especially if the instructions to him encourage this. And he may continue to make responses for a considerable period of time, especially if there is variety in the task situation. Those features desirable for high productivity are present in the test items used. With time pressure, a better strategy achieves a higher percentage of success. It seems reasonable to think that understanding of when to read, and speed and flexibility of reading are roughly analogous to the potential strategies to be employed by students in working on the Torrance and Covington tests. While no evidence is available, it seems reasonable to believe that the child's ability to utilize an appropriate mode/style of reading, and to be adaptable in his reading, will both contribute to success in creativity and problem-solving as measured in this experiment. (D. M. Johnson, 1955, pp. 75-79; Bruner, 1956, pp. 146-147)

Point 6: What opportunities does the child have to work with the teacher in a group situation?

According to Heilman, "...Much of the activity in the classroom is ego-involved activity..." and the teacher "...is in a therapeutic relationship with children because of the very nature of the school and the activities which are carried on in the school." (Heilman, 1961, p. 327) Thus the teacher has tremendous opportunities each day to influence children in her class, and one of the most important ways in contemporary classrooms is in working with children in groups. The teacher who uses the BR method will divide her reading instruction for the week in such a way that she will meet with each reading group three, four, or possibly five times a week. Each group meeting affords the teacher an opportunity to help children improve their reading skills, and also improve their mental health.

The teacher who uses BR instruction has two opportunities to work effectively with children in groups. The first of these is when she works with the total class, as when the whole class works on a phonics game. The other opportunity is when she works with each reading group separately. Teacher influence in the group situation can be very helpful in improving the child's reading skills, and in improving the child's self-image. But because of lack of choice by the child as to membership in the group, because of the relative infrequency of shifting children from group to group, and because many teachers never explore some of the varied opportunities for group work possible with BR, the maximum benefits are seldom derived. (Visit C-4-3; Russell, 1961, pp. 145-146)

The teacher who allows children to individualize their reading is asked to work with children in groups in three ways. The first is when she works with the total class, and would be comparable to the same situation in BR. The second is the group situation where the teacher invites children with a given skill deficiency to work together. In this case, the psychological situation will be slightly different, and possibly considerably different from the group situation in a BR program, for the reasons mentioned above. The third group situation will be those cases in which children form their own interest group to pursue a given interest and share in thinking together about it. This is an ideal opportunity for the teacher to serve as a resource person to the interest group, and is a different psychological as well as instructional role when compared to group work by the BR teacher. She should be available to members of the group, singly or together, for consultation about reading skills and also research skills and activities. (ASCD, 1962, pp. 239-240)

Andrews spells out some of the ways in which group work may lead to creativity by children. For example, flexibility in the use of time, the gradual building of standards meaningful to the group, and exposure to quality materials, become door-openers to greater risk-taking and higher productivity by children. Similarly, in discussing problem-solving in arithmetic, Fehr mentions several activities that children should participate in: estimation, working out mental solutions, and the association of language with operation. All of these are readily usable in group situations, especially with small groups. And they can make a contribution to success in problem-solving as a more generalized skill. (Andrews, in Fleming, 1963, pp. 440-449; Fehr in Crow, et al, 1961, pp. 378-380; Shaftel, 1952; Yarmolinsky, 1960, pp. 272-274)

Gordon, describing experience with "synectics," notes the contributions of group interaction to success in problem-stating and problem-solving. The expert in the synectics group, like the teacher in an IR classroom, serves as a resource person. Partly due to the help of the resource person, the group improves in the number and elegance of its solutions to problems. (Gordon, 1961, p. 117)

Children who work with a teacher in group situations in IR have better opportunities, in my opinion, to learn those group and individual skills which will help them score well on the creativity and problem-solving tests used in this research.

Point 7: With which classmates does the child associate in his reading activities? On what basis is this association?

"When children come to school they can learn in deliberately created settings the meanings of belonging to many kinds of groups. It is almost as if each year in school, and to a certain extent each significant inter-personal experience, provides children with the opportunity to stop and claim membership in a given group long enough to evaluate what they have carried forward from earlier associations and to create something worth carrying forward to new relating." (Miel & Brogan, 1957, p. 350)

Individualized reading and basal reading, from the child's point of view, afford child association opportunities in somewhat different ways. In most BR situations, the teacher assigns each student to a regular reading group. Most of the time devoted to reading is likely to be spent as a member of the assigned group. Generally, this is another instance in which the teacher arbitrarily assigns children to groups, leaving them with virtually no opportunity to participate in this important aspect of decision-making: choosing one's work group. However, there are exceptions: teachers who ask children their preference, or who use sociometric devices in deciding how to group. When the child is at his seat doing the work assigned to his group, he is still psychologically a member of the assigned group, and this may influence his attitude toward reading and other school work. Some BR teachers will form occasional sub-groups to work on particular skill needs, such as words beginning with "B" or a particular medial vowel. At such times, the grouping is more realistically homogeneous, and the psychological situation may be improved for the individual member of the sub-group. In such cases, a goal is "meaningful communication." From what has been said, it appears that such communication is possible in a BR situation, but that there are certain psychological barriers that may prevent the development of an optimum situation. (Gage, 1963, pp. 704-706; Witty, 1964; ASCD, 1962, p. 242; Thelen, 1963)

In an IR situation, the child spends most of his time reading on his own. However, this is by no means a non-social, much less an anti-social, experience. In many instances observed in the 1963-64 school year, a child would go to another to share his enjoyment of a book. These are associations by choice. (Whitcomb, 1956; Visit X-4-5)

Children in an IR program will have two ways in which they can work with others that are largely child-choice opportunities. One of these is when children choose to sit with each other for quiet reading. Each child will read his own book, and there may be little or no verbal communication between children. But the psychological proximity that accompanies the physical proximity appears to have a positive influence on many children. The second opportunity will be the voluntary interest group. Suppose 5th graders are studying Colonial America, and a group of girls wishes to work on home life and household arts; in an IR program, they could form their own group for this purpose, and spend parts of a number of reading periods in gathering information, and possibly planning and preparing ways of reporting that information to the rest of the class. In a few BR classes, the same psychological benefit may accrue -- as seen in the film "They All Learn to Read." (Sheldon, 1955; Darrow & Howes, 1960, pp. 56-60; ASCD, 1964, pp. 94-97)

Torrance points out the importance of human interactions for the cultivation of creative responses: association with others gives the child multiple opportunities to compare his ideas and to recognize the value of his own talent, association with others can provide many encouragements to persist in one's efforts, and the vital role of the child's association with his peers may be of greater importance than his relationships with teachers or with parents. (Torrance, 1962, pp. 144-146, 150-158; Sears, 1964)

Choices and choice-making, influenced by the individual's peer relationships, helps the child to feel confident, and to take the risks inherent in striving for creative forms of expression. Through cooperative research activities and constructive debate on issues, young minds can improve their facility in dealing with problems. Thus the social aspects of the reading enterprise relate to both creativity and problem-solving. (Pritzkau, 1959, pp. 61-67; Burton et al, 1960, pp. 335-343; Scobey, 1963; Bruner, 1963)

Point 8: To what extent does the child have an opportunity to work with the teacher on a 1-1 basis? In what ways does this influence creative and problem-solving behavior?

Many students of teaching-learning techniques agree on the importance of opportunities for a child to work on a 1-1 basis with his teacher. Proponents of BR advocate working in this way. Yet the teachers' manuals for the basal series suggest so many activities designed for the whole group or the sub-group that little time can be found for the teacher to see individuals. Furthermore, in practice, many teachers who do devote time to individuals select the most retarded readers for such attention. In such cases, the singling out may well be seen by the child as negative: a further overt recognition of the fact that he is having trouble. (Spache, 1963, pp. 154 & 160-161; Crow et al, 1961, pp. 65-68; Dickinson, 1959)

The individual conference in IR contributes something to each of the three areas of teacher-student interaction described by Hilgard. (NSSE, 1964, pp. 192-202) The first of these, affective interaction, involves the child's emotions and attitudes vis-a-vis his teacher. By the very fact of using IR, the teacher shows each child he is valued -- he is of such worth that the teacher will work with him individually, recognizing the uniqueness of his needs in learning to read. Whether the teacher follows the plan of calling students to the individual conferences, waiting for them to ask for a conference, or doing some of each, the effect bolsters the child's ego. Perhaps the greatest boost is if the teacher waits for the child to request a conference. The length of each conference, as well as frequency, depends on the teacher's estimate of each child's need. (Barbe, 1961, pp. 31-32, 45-48)

What happens in such conferences that may make a contribution to creativity and problem-solving abilities? First of all is acceptance -- acceptance that enhances self-image. The child who is accepted ventures, and venturing is important to creativity and problem-solving. (ASCD, 1962, p. 36; Combs & Snygg, 1959, pp. 155-156; Suchman, mimeo)

Second is encouragement, especially encouragement to self-expression. Such questions as "Why did you choose this book?" or "What is the most fun part of the story?" encourage the child's personal reaction. (Veatch, mimeo) In a private conference the child is less likely to be inhibited. Especially after he has become used to the idea of the freedom and privacy of the conference, he may be more willing to venture his own ideas and opinions and feelings. Also, he will be more willing to acknowledge his need for help than he would in a group situation.

Teaching should stress the unity of reading experience. In too many instances basal reading instruction focuses on a particular problem (such as words ending in "-tion"). This often results in neglect of meaning and interpretation, especially the subtler and more private meanings that may come out in a conference. This is "the forest and the trees" problem: BR examines each tree in some detail, but the child may be left to see the forest for himself. The Covington problems, in particular, require the child to keep the whole problem in mind, in spite of distracting details. (Appendix 9)

Intensive (and very good) teachings of mechanics can fail to give the child adequate opportunity or encouragement to find the deeper satisfactions possible in private reading. Focus on the individual's own interests in personal reading can result in greater willingness to make the effort to deal with the open-end situations in the Covington and Torrance tests. (W. Gray, 1957; Spencer, 1953)

The second set of interaction variables discussed by Hilgard is evaluative interaction "in which the teacher judges and criticizes, rewards and punishes." (NSSE, 1964, p. 192) In BR, much evaluative interaction occurs in a group situation, This tends to limit the range of behavior by both teacher and students: the teacher may make general comments that apply to several students, and the students are reluctant to acknowledge not knowing something. Occasionally a "cover-up compact" develops in which a group of children try to distract attention from too close questioning by the teacher, and the teacher must tread a careful line between destructive criticism and the pussy-footing evaluative comments which may be highly ambiguous to children. As described above, the individual conference in IR can avoid much of this difficulty. The teacher can probe more expertly and pinpoint her questions in a private conference because they are aimed at one child and his specific contemporary problems. (ASCD, 1963, pp. 133-134)

In either IR or BR, the teacher can use one of the most valuable positive techniques in his arsenal: personal interest combined with careful listening. "Such techniques probably provide an atmosphere in which the child can permit himself more leeway in expression of unconventional ideas without threat of devastating criticism." This makes it easier for the child to build confidence, confidence so important in dealing with the Torrance and Covington tests. (NSSE, 1964, p. 195; Whitcomb, 1956)

The third type of interaction discussed by Hilgard is cognitive. In this interaction, the teacher imparts knowledge and skills and teaches approaches to problem-solving and the creation of products appropriate in a particular context.

In both BR and IR, teachers perform these functions. But it appears that the IR teacher has greater opportunity to do them directly and in consonance with the on-going educational-emotional growth of the child. Once the child has accepted the nature of the new reading program, and has come to understand the quality of the new relationship with his teacher, he can learn to use the individual conference as a means of getting the help with skills he needs right now. Because of the press of other business, the student and teacher in BR are not so likely to achieve this kind of relationship. If the child gets the kind of cognitive help he needs, his confidence in the teaching-learning process rises. His facility in using reading to solve problems improves. He will have the increased reading skills and the increased self-confidence that will enable him to make a better showing on the Torrance and Covington tests. (Adler, 1958, pp. 115-117; California Journal of Elementary Education, November, 1958; Frazier, 1961; Gage, 1963, pp. 388-391; McFee, 1964)

Point 9: To what extent does the child have opportunities to work alone and independently?

In both IR and BR, children have opportunities to work alone and independently. But, the child in IR has more opportunities, and the psychological situation in IR is distinctly different.

The BR program tends to be full, full in terms of time, and full in terms of planned activities. By contrast, the IR student spends most of his time in independent work; only a lesser portion is likely to be spent in group activities. The IR student becomes used to thinking of independent work as the fundamental part of his reading. Psychologically, this differs from the BR situation in which the independent work is incidental to the main features of the program. (Veatch, 1959, pp. 120-124)

What are some of the mental and emotional factors related to independent work that may relate to creativity and problem-solving?

1. Openness to experience. Speaking of the creative person, Carl Rogers says, "I find such a person to be sensitively open to all of his experience — sensitive to what is going on in his environment; sensitive to other individuals with whom he is in relationship, and sensitive perhaps most of all, to the feelings, reactions and emergent meanings which he discovers in himself." The child with wide and relatively unstructured opportunities to work independently will be more likely open to experience. It seems probable that openness to experience will help the child who is faced with the tests used in this experiment. (ASCD, 1962, p. 31; H. Anderson, 1959, p. 68)

2. A cognitive style which is flexible and "accessible" to new experience. Klein contrasts the "leveler" with the "sharpener." The former holds tightly to his categories of perception, tends to over-generalize from past experience, and to respond in the same (or very similar) fashion to stimulii substantially equivalent to earlier ones. The sharpener is more flexible in coping with environmental data, is alert to change, and responds to finer nuances of meaning and small differences. (Steinberg, 1963; Allport, 1955, pp. 59-60)

The child used to working independently rather than on a steady diet of teacher-assigned tasks can be expected to change in the direction of becoming a sharpener. I believe that the sharpener would perform better on the tests used in this study. (Brogan & Fox, 1961, p. 209; ASCD, 1964, pp. 50-74; Ashton-Warner, 1963, pp. 32-34)

3. An "adequate" self-concept: "When one has confidence and pride in his self-image, he feels free to be and to express himself." The child in most IR programs enjoys

many opportunities for daily exploration of his environment and the meanings it may have for him. This may be expected to contribute to his confidence and willingness to venture answers to creativity and problem-solving tests. (Steinberg, 1963; ASCD, 1963, pp. 107-120; Sexton, 1964)

Openness to experience, an appropriate cognitive style, and an adequate self-concept grow as the child enjoys freedom to work independently. "Autonomy grows as it is exercised." (Suchman, 1962, p. 82; Taba, 1963; see also, supra, discussion in Pt. 8)

Point 10: To what extent does the child have opportunities to work on "extension" activities?

"Extension" activities refers to those activities of many sorts which the child himself considers to be an extension of his interests and on-going pursuit of reading. What is extension and what is being extended is not really so important as that it seems part of a meaningful whole to the child. "In creative individual activities reading cannot be separated from writing or writing from reading." It is assumed that this relationship also exists between reading and drama, and reading and several of the forms of visual art. (Spencer, 1953; Allen, 1958; Zirbes, 1928, p. 25; Visit X-5-5)

The teachers' manual of most basal readers suggest activities to extend interest and give further experiences related to a particular story. These may be as varied as art and construction activities, creative writing and drama, poetry, related reading, and even trips. However, BR, in extension activities as in independent work, suffers from the disadvantage that too much detail competes for attention.

IR relies much more on the validity of the child's interests and desires to lead him into useful relevant avenues. According to Olson, the child's interests will lead him, over a period of time, into avenues worthwhile for him. The analogy may be made: IR has psychological and practical similarities to non-directive therapy. They both succeed because they show the ultimate respect for the individual: they assume that he "knows," in some real and practical sense, and in ways that are accessible to him what is "good" for him. Many extension activities are most appropriate for groups to undertake. The students in BR groups may be assigned to participate in such situations. In any event, they are assigned to groups by the teacher for most of the reading period of each day. By contrast, the IR student works most frequently in a group he has chosen to belong to, perhaps one working on the same line of interest, such as types of mammals. (Olson, 1952; Rogers, 1951; B. Parker, 1962; Russell, 1961, pp. 365-366; Adler, 1958, pp. 103-110)

One comes across frequent examples in the daily newspapers of ways in which a person exploring his own interests achieves success in problem-solving, and a new mechanical device or perhaps a new process is developed. Fifth and sixth grade students react favorably to situations in which they have opportunity and encouragement to explore. Fleming calls for "continued exploration." (Fleming, 1963, p. 431) The teacher should encourage the expression of student ideas in "meaningful forms." This may call for the setting up of learning situations in which children start with facts, materials, events, and put them together in ways that seem most appropriate to them. Or, the self-actualizing child uses the materials available to him, gathers more on his own, and achieves new understandings about the nature of the world in which he lives.

The child's curiosity provides a powerful stimulant to searching activity. The "maintenance of exploration" once started depends on the searcher seeing the potential benefits as outweighing the risks. The individual with experience in independent work will often have a "sense of the goal of a task" which may see him through to a conclusion.

These positive factors can combine to produce what has been called "self-sustaining educational effort." This type of activity, especially if practiced a number of times, may lead to success in problem-solving. (ibid.; Taba, 1963; Ausubel, 1958, p. 51)

The same factors influence creative activity: some inner spark such as curiosity, opportunity, an atmosphere of acceptance, freedom from some of the restraints of time schedules, and some inner feeling of a goal -- something ahead that is worth trying for. These psychological factors may be present in the extension activities programs in IR to a greater extent than in most BR programs. Hence, on this assumption, it is predicted that the X students would exceed the C students in scores on the Torrance and Covington tests. (Yarmolinsky, 1960, pp. 259-260, 276-279, 281-284; Thomsen, 1959, pp. 185-201; McKellar, 1957, pp. 175, 177, 194)

Extension activities, whether individual pursuit of more information, individual or group creation of some verbal or visual art form, or individual or group reporting, can all contribute to success in the Torrance and Covington tests. I do not believe the reporting activities of the X classes differed appreciably from those of the C classes. But I believe the other extension activities of the X classes did provide greater stimulus to creative and problem-solving behavior than those of the C classes.

Point 11: Why one could expect the IR students to read more books than the BR students.

So much of the BR student's time during the reading period is devoted to work in the basal reader or auxiliary materials that little may remain for self-selected reading. Additionally, some supporters of BR suggest that each student have, besides his basal reader, a second basal reader, one-half grade level or one grade level below that being used in his regular reading group. The rationale for this is: give the student extra practice to improve his speed and fluency, and this can best be accomplished with a book a notch or two below his current mastery level. Suppose that this hypothetical child, then, is reading three books concurrently; besides the two readers, he has a pleasure book of his own choice. Assume he reads two such self-choices while he completes the two readers. Total reading: four books. In that same amount of time, many IR students would have read almost entirely self-chosen books. With time taken for conferences with his teacher, some for work in a group (including reporting and sharing activities), some for book selection, and, to be realistic, some time wasted, he will still have a lot of time for reading. An estimate, based on many visits to both X and C classes in this study, is that the IR student will have at least twice as much net time for uninterrupted reading as the BR student. If anything, this estimate is conservative. (Sartain, 1961; Appendix 3)

A number of people report a considerable increase in out-of-school reading by children after starting IR. Witty found in 1962 that Chicago area children in grades 3 to 6 read, on the average, one hour per day outside of school, though he made no record of the type of instruction they had in reading. The present writer expects IR to increase the amount and also the speed of this outside reading. It is also expected that the X students would read more outside of school as well as during school hours. (Witty, 1962, p. 67)

SUMMARY

In this chapter, the situations faced by the child in BR have been contrasted with those which the child encounters in IR. Both IR and BR can do much, not only to facilitate the learning of the developmental reading skills, but also to encourage creative and problem-solving activities by the individual. A teacher who conducts a BR program as illustrated in the film "They All Learn To Read" may provide children with the freedom and inspiration which will nourish creativity and problem-solving. There is no guarantee that the IR teacher will do so, as Carr discovered in her observations. (Sheldon, 1955; Carr, 1958)

The teacher in an IR program may go far in the direction of affording the child freedom to choose his own reading material, read at his own pace, and associate with children of his choice. She will serve as a resource person to individuals and groups. In private conferences with her students, she will offer direct assitance in reading skills and in encouraging the child to have faith in his own interests and his own taste. She will help the child to appreciate the opportunities for independent pursuit of his own goals, dim though some of them may be. According to a number of the advocates of more creativity and problem-solving activities in the elementary school, the psychological conditions of IR will stimulate the child to make the kinds of effort that lead to success in these activities. (Myers & Torrance, 1961, p. 2; Sears, 1964; Taba, 1963; Suchman, 1961A, ASCD, 1963, pp. 283-321; Fleming, 1963, pp. 279-313)

In addition, the time for reading in IR, the nature of reading done, and the conditions under which the reading is done, lead me to expect that students in an IR program would read more books during a school year than students in BR.

CHAPTER IV

PROCEDURES USED IN THIS EXPERIMENT, AND FACTORS THAT MUST BE CONSIDERED IN INTERPRETING THE RESULTS

What are the purposes of Chapter IV? First, it will state the questions to be answered in this investigation. Second, it will outline the procedures followed in carrying out the research. And third, it will discuss some factors that should be remembered in interpreting the results.

Hypotheses

What are the questions to be answered, what are the hypotheses to be tested?

1. Will there be a difference in the number of books read by children in the two programs of learning to read during the experiment?

2. Will children in the two programs differ in improvement on "generation of ideas" (creativity) tasks, and on verbal problem-solving tasks, comparing post-test with pre-test scores?

3. Will boys differ from girls on number of books read, or on the creativity or problem-solving tasks?

In all cases, the null hypothesis will be tested: the type of reading instruction will not have a significant influence on the number of books read, or on the test performance of the child. The level of significance will be .05. Only if the statistical analysis indicates that the level of significance is .05 or "greater" will there be warrant for rejecting a particular null hypothesis.

What type of research is this?

Gage defines research as "...activity aimed at increasing our power to understand, predict, and control events of a given kind." (Gage, 1963, p. 96) Does the present study qualify as research? Since it is an activity aimed at increasing the abilities of teachers to understand two methods of teaching reading, helping them to predict some of the outcomes of the two methods, and helping them to control variables that are part of the enterprise of learning to read, it fits Gage's definition.

This particular study, hopefully, has a relationship to what Calvin W. Taylor calls "bridging the gap," by which he means efforts to state the findings of experiments and other research in terms which are understandable to classroom teachers, and to present ideas and techniques which apply to real classroom situations. An attempt will be made to build one more bridge in this particular area: by evaluating some of the aspects of IR and BR in operation. (Taylor et al, 1962)

Securing teacher participants

What steps were taken to secure the participants for this experiment? It is not a simple task to persuade districts to allow their teachers to teach by an unfamiliar method, nor is it easy to persuade teachers to try such a method. Twenty-nine school districts in the San Francisco Bay area were approached. Of the twenty-nine, five agreed to participate. Central office personnel referred the writer to building principals. Some of these principals agreed to see if teachers would undertake the work. One reason for their hesitancy was that no promise could be made to teachers in the spring of 1963 as to which method of reading they would be asked to teach in the 1963-64 school year. Before pairing the teachers, it was essential to get data on all who would participate; this could not be completed until August. In spite of these problems, twenty-one teachers agreed to participate.

Information was received from the principals as to each teacher's years of experience, years at present grade level, and the principal's rating of the teacher as a teacher of reading. Principals were generous in giving time to discuss their teachers. In addition, I spoke to each teacher individually. Based on the information gathered, the teachers were paired. For example, a man with ten years' teaching experience of which seven were at his present grade level would be matched with a man with nine years' experience of which five were at his present grade level -- providing the ratings of principals indicated they were a fair match for each other. When the matching was completed, a coin was flipped to decide which would teach by the X method and which by the C method. Teachers were then notified so they could plan accordingly. These teachers will be referred to as the "randomly assigned," or RA group.

In one district, the assistant superintendent in charge of curriculum suggested that the study would be improved if some teachers were allowed to teach by the method of their preference. No teacher in this group would be teaching by a method he did not like. Eight teachers in two districts joined the project on this basis. These teachers will be referred to as the "teacher preference," or TP group. An attempt to pair these teachers according to the criteria used for the RA group failed. As an alternative, three of the teachers in this TP group who taught in a departmentalized system taught one class by the X method and another by the C method. Table 1 shows the grade, sex, and years of experience of the fifteen teachers in the RA and TP groups whose students were used as the sample for this study.

Table 1A lists the fourteen classes not included in the analysis of data for this experiment, and gives the reason for non-inclusion.

The students in the study were those regularly assigned to the volunteering teachers. It proved impractical to have students switched in order to achieve equality of groups on IQ, reading achievement, or division into boys and girls. The analysis of covariance statistic was decided upon as a means of making meaningful comparisons in spite of initial inequalities. (below, Chapter V)

None of the teachers who taught IR during the 1963-64 school year had taught by that method before, although several of them had done some reading about it, and all of them had considered making substantial changes in their methods of teaching reading. The students, too, had not previously experienced IR. Both teachers and students need experience to become thoroughly acquainted with a new method. This seems to be especially true in grades beyond the primary ones when students have worked previously by a different method, and one followed consistently for several years. The newness of the IR method to both teachers and students should be kept in mind when considering the findings of this study. (Stine, 1962)

TABLE 1

TEACHERS WHOSE TEST DATA WERE USED IN THIS STUDY

RA Teachers	Grade	Sex	Years at Grade Level	Total Years Teaching
X-1	5	M	1	1-1/2
C-1	5	F	2	2
X-2	5	F	3	4
C-2	5	F	4	20
X-3	5	F	1	20
C-3	5	F	10	22
X-4	6	M	3	3
C-4	6	M	3	5
X-5	6	M	5	10
C-5	6	M	5	8
X-6	6	F	1	3
C-6	6	F	1	3
TP Teachers				
TP X-7) TP C-7)	5	F	2	5
TP X-8) TP C-8)	5	M	5	5
TP X-9) TP C-9)	5	F	4	15

TABLE 1A

Class	Reason for non-inclusion
A	Unable to test at scheduled time
B, C, D, E, F	4th grade classes. Insufficient comparable pairings. 1 teacher considered testing invalid for her class. 1 teacher misunderstood IR.
G, H	Teachers transferred in mid-year
I, J, K, L, M-1* and M-2* (* 1 teacher)	Unable to match teachers according to criteria established. 1 teacher misunderstood IR.

In-service program

An in-service program, starting in the spring of 1963, began the job of orienting teachers to the study, and especially to IR, a method with which none of them had had previous experience. However, considerable attention was given to ways of using basal reading to provide a strong instruction program. For example, the cross-group grouping system advocated by Durrell was suggested to BR teachers as one means of going further toward accomplishing the goals of their program. In this system, the teacher, when he notices that children in two or more of his regular reading groups need help with the same skill, invites them to join a special group to work on that skill. (Durrell, 1956, pp. 126-127) Workshops were held in each district either in late spring or August and September of 1963. The writer talked with each teacher individually to answer specific questions. In addition, later workshops, individual conferences with teachers and principals, and periodic newsletters were features of the in-service program. (Appendix 4) I visited teachers in the study approximately five times to observe the reading program being taught. A written observation form, prepared for this purpose, was filled out at the time of each such visit. (Appendix 3) A portable professional library on the teaching of reading was available to all teachers from spring 1963 to spring 1964, and was extensively used. The newsletters suggested a considerable variety of reading materials bearing on the teaching of reading, and effective ways of working with children in the classroom.

Testing schedule

Fall testing took place during the weeks of September 23 through October 4, 1963. It was scheduled to avoid the yearly California standardized testing between October 15 and November 15. The spring testing was administered during the last two weeks of May 1964. Detailed general instructions and very specific individual test instructions accompanied the boxes of tests delivered to each teacher a week in advance of the start of testing. Dr. Martin Covington, who has had considerable experience with both the Torrance tests and his own tests, served as consultant on the instructions and the procedures for test administration. A calendar for the year specified the dates for testing, the dates between which number of books read were to be counted, and other details. Each teacher received this calendar at the time he agreed to participate in the study. (Appendix 5)

Classroom libraries, and books read

Each teacher was encouraged to build a classroom library. The rationale for this is simply that an IR program functions best if a substantial quantity of books is present in the room at all times, and if BR is to be compared fairly, the BR students must have comparable access to books. At each of the pre-school in-service meetings, teachers were given a bulletin stressing practical ways of augmenting normally available supplies of books. (Appendix 5) In November 1963, a survey of all teachers in the study revealed an average of 402 books in the room libraries. This exceeds the generally recommended minimum of 100 per room for an IR program. All participating teachers, as part of this experiment, encouraged wide reading by their students. (Lucy Hunt, 1961, pp. 22-23; NYC, 1960, p. 15)

A fundamental question to be faced is what criterion we use for "books read." How do we decide whether a child has read a particular book or not? If a teacher is to do a thorough job of teaching reading, whether IR or BR, she cannot devote an undue amount of time to checking to see if a child has really read a book. Teachers in this study were given an instruction sheet at the beginning of the study along with a standard form to be used in listing the books read by the children in their classes. (Appendix 1) Each teacher also received oral instructions concerning criterion to be used to decide: did this child read this book? The criterion adopted was: if the child says he read the book and the teacher has no strong reason to doubt his word, the book is to be included on the child's list. Teachers were asked to keep the lists for all students at their desks, and to add or supervise the addition of books to each list. The rationale for the criterion adopted was: (1) an undue amount of teacher time would be required to make "sure" that a child had read the book and even then, a margin for error would still exist; (2) a relatively relaxed standard such as this one favors neither of the two reading methods, yet it encourages voluntary honesty on the part of students; (3) an important psychological feature of a sound instructional reading program is reminding the child that in the last analysis he is the only one who can accomplish anything from his reading, that he is the true beneficiary of reading; once he becomes used to this, there is little reason for dishonesty in reporting number of books read. (Hunnicutt & Iverson, 1958, pp. 154-167)

Comparisons made in this study

Tables 2 and 3 show the comparisons to be made in the present study at Grade 5 and at Grade 6.

TABLE 2

ARRANGEMENT OF CLASSES FOR COMPARISONS IN THE PRESENT STUDY

Grade 5

RA (randomly assigned teachers)		TP (teacher preference: teachers taught 2 classes, one by each method)	
X	C	X	C
___Boys	___Boys	___Boys	___Boys
___Girls	___Girls	___Girls	___Girls
___Total	___Total	___Total	___Total

TABLE 3

ARRANGEMENT OF CLASSES FOR COMPARISONS
IN THE PRESENT STUDY

Grade 6

RA (randomly assigned teachers)	
X	C
___Boys	___Boys
___Girls	___Girls
___Total	___Total

The program used for the computer made comparisons between treatments (X - individualized reading, vs. C - basal reading), between sex, and between pairs. In each group of teachers or classes, there are three pairs. For example, in the RA group, grade 5, there are three pairs of teachers matched with each other; the same is true of the RA group, grade 6. In the TP group, there are three pairs of classes, each pair taught by the one teacher. The analysis will note those instances in which differences between treatment, sex, or pairs show significance. Also, interactions between these conditions (such as pair-treatment interaction) are also calculated. Finally, within the total RA group (including all the 5th grade and all the 6th grade students in the RA group) comparisons between the performances of the two grades will be made: 5th graders vs. 6th graders. (Table 1)

Factors to be considered in interpreting the results

With the details of the experiment in mind, it will be appropriate to look at factors which may affect the results of such research as this. Mention will be made of what was done, if anything, to take these factors into account.

We do not even know all the relevant variables with which we may be dealing in an investigation of this type. Rhine has shown fairly conclusively that some humans have some type of extra-sensory perception. But the nature of this power (or powers) and many other potentially relevant variables may pass unrecognized. In any experiment such as the present one, it seems a strong probability that a number of variables which are not accounted for have influenced the outcomes described. A potential value of a doctoral dissertation is insight by someone reading it that may lead to further understanding of such a variable. This is clearly part of the history of science, and an important hope for research in the future. (Rhine, 1947; Bridgman, 1959, pp. 288-291; Dewey, 1933, p. 207)

A number of variables do exist which are common to all (or most) research projects involving teaching methods, although their influence on our experiments usually cannot be measured.

Campbell and Stanley say that "...internal validity is the basic minimum without which any experiment is uninterpretable: Did in fact the experimental treatments make a difference in this specific experimental instance?" (Gage, 1963, p. 175) Factors which may jeopardize internal validity in this experiment include:

1. History, the events which occur between pre- and post-testing, besides the experimental variable. In the present case, one could ask: What influence does the rest of the school day have on an experiment in which (theoretically) the reading period alone is at issue? One can be certain that a rich social studies program, an exciting science program, or a lively music program -- each or all of these -- will affect the student's motivation toward, and activity in, the reading program. This is especially true by the upper elementary grades, when so much of the available material, both informational and interpretive, is found in print. In the RA classes of this experiment, the classes were self-contained, so the majority of "extraneous influences" from other parts of the school day would come from the regular teacher. In the TP classes, most of the students had the reading teacher only at the one period each day; the influences of several other teachers would play a part. But in both the RA and the TP groups, the effect of the other parts of the school day, indeterminate though they may be, contaminate this experiment. Hence, it would be unjustified to conclude that this is a pure reading experiment. (ibid.)

2. Maturation, the "intrinsic forces of development," both physical and mental, influences the changing abilities of each human individual, and especially children in school. (NSSE, 1964, p. 215) One can expect that children of 10 to 12 years of age will change between a given September and the following May. Almost certainly the changes, interacting with learning activities at home and school, will result in some difference in performance on tests, probably including performance on creativity and problem-solving tests. (Gage, 1963, p. 175)

3. Testing: If a child takes one test, this may have an effect, even though slight, upon succeeding tests he takes. The possibility of this would be enhanced in this study since the subjects took the identical problem-solving tests in fall and spring. Further, the paired Torrance tests, one given in fall and the other in spring, are very similar in what they demand of the subject. (ibid.)

A very basic consideration in the Torrance creativity tests and the Covington problem-solving tests is fluency. The child is presented with a task or a problem; he has some encouragement or stimulation to work on it; he also has time limits, and a single opportunity to work on the test. What he can accomplish in the time available is necessarily a limited work-sample. Guilford has identified expressional fluency, word fluency, and ideational fluency as factors in the creative act. In the Torrance tests, pictorial fluency may be an additional factor. (Taylor, 1964, pp. 19-20, 85, 121)

Related to fluency is the particular plan used in scoring the tests. For reasons of economy, only two scores were derived from each test: a simple count of the number of ideas that had been judged to meet the requirements of the tasks, and a primitive determination of the relative value of the ideas expressed by the children. Both of these were done by referring to tables prepared by Covington for the scoring of the tests. The relative value (number of points) earned by each child depended in part on his fluency (number of ideas expressed), and in part on the relative infrequency with which those ideas had been expressed by the students whose tests Covington used in the construction of the tables. The more frequently an idea was expressed, the lower its point score. Perhaps an explanation of this scoring procedure to the students before they took the tests would have resulted in some measurable differences on their performance.

4. Instrumentation, or the differences between observations by one person, or between observations by several observers, may cause changes in the obtained measurements. This topic is covered below in Chapter V, discussion of the scoring of the tests.

5. What influence does the socio-economic status of the subjects' families and the neighborhoods in which they live have on the outcomes? This is referred to as differential selection of subjects. (ibid.) While it is possible that Warner, the Lynds, Hollingshead and others may have oversimplified economic determinism in education, most teachers who work with children coming from a variety of socio-economic backgrounds find it hard to accept the conclusion that class and status don't matter. (Charters & Gage, 1963, pp. 3-11 & 181-189) Classes from "high," "medium," and "low" income neighborhoods participated in the study. When it came to matching teachers for the RA group, there were several instances in which the paired teachers taught in very different neighborhoods. (California Elementary School Administrators Association, 1962; see below, pp. 60-62)

6. Will experimental mortality, or differential loss of respondents from the comparison groups, affect the results of the study? The mobility of population in California means that some subjects in an experiment will have moved before the post-testing. Because of absences on some of the testing days, scores of some students were missing. No effort was made to count the absences or the transfers in either X or C groups, or to

counter the likely influence of unequal losses from the original group. (Gage, 1963, p. 175)

Another set of factors which may impair confidence in the outcomes of an experiment are those which may interfere with its external validity. "External validity asks the question of generalizability: to what populations, settings, treatment variables, and measurement variables can this effect be generalized?" (ibid.)

7. Among these are interaction effects of selection biases, whether fortuitous or not, on the experimental variable. A critic could say: the characteristics of the sample participating in this experiment are such that the IR method had only a slight chance of modifying the behavior of students, and hence the test scores. As implied earlier in the chapter, it was desirable to have a large number of initial teacher participants, since one would anticipate that, for a number of reasons, not all of them would end up as part of the final sample. This turned out as expected; the data reported here came from classes taught by fifteen of the original twenty-nine teachers. However, this had consequences for the student sample; almost half of the original student subjects were left out. Had they been included, would the results have been the same? (Table 1, Table 1A)

8. The Hawthorne effect: Another force which could have influenced the results is what Campbell and Stanley call "reactive effects of experimental arrangements." This can be stated in question form: What influence does the Hawthorne effect have on the results of this experiment? (Gage, 1963, p. 176) Cook defines the Hawthorne effect as "...a phenomenon characterized by an awareness on the part of the subjects of special treatment created by artificial experimental conditions. This awareness becomes confounded with the independent variable under study, with a subsequent facilitating effect on the dependent variable, thus leading to ambiguous results." (Cook, 1962) The IR students, he would say, were aware that an experiment was being conducted; the special materials, procedures, testing, attention given their teachers and their classes would cause additional interest on their part in reading. Parenthetically, the mere presence of an investigator adds an unmeasured variable in a classroom situation. (Bridgman, 1959, p. 80) In several of the classrooms, I was known as the "testing man," or "the man who's interested in how we read." There can be no doubt that the Hawthorne effect is present in this experiment. All of the aforementioned "specials" must have, to some extent, impinged on the consciousness of the students. Even relatively unsophisticated students know that extra tests given on behalf of an outsider mean someone has an ulterior motive.

A number of researchers have suggested that one should pay as much attention to students and teachers "in all treatment groups as in those of particular interest to the experimenter." (Cook, 1962) The C teachers in this study participated in the same in-service meetings, received the same handouts, and were visited as often as the X classes. The investigator showed the same interest in the C students also. In several instances, this "succeeded" -- students in several of the C classes were highly motivated toward the experiment, and understood that it was desirable for them to do the best job they could. But this enthusiasm itself becomes a contaminating influence -- what we really want to know is: will the IR method cause differences in student performance when two groups of children are compared under "normal" classroom circumstances? What we do in practice, generally, is find out whether there are differences when the comparison is made under non- "normal" circumstances. One may hope that in this instance approximately the same quantity and quality of non-normality was present in both the C and the X classrooms. (Aranow, 1961)

There are a number of other known variables present in this study whose effect cannot be measured, though their importance may be recognized.

9. Do the tests used in this experiment measure what they purport to measure? This question has been discussed above in Chapter II, pp. 18-21, where it was concluded that they do.

10. "Purity" of method: How "pure" are the X and C methods as practiced by the teachers in this study? Although all participating teachers received pre-service and in-service information as to the method they were asked to teach, and although visits to the classrooms served as a reminder of their contract to teach by the agreed-upon method for the year, it cannot be concluded that this worked out entirely according to plan. For example, one teacher misunderstood IR. Another interpreted IR in a private way, and taught a method that can best be described as a cross between IR and BR. The tests of these classes were not scored. Thus, classes that were not able to follow the BR and IR methods as prescribed were eliminated.

However, this took care of only the gross discrepancies. Both IR and BR are global methods, involving a variety of activities by teachers and students. All of the IR teachers, except for those mentioned above, learned to allow students to choose their own books and to read at their own pace; most of them also learned, at least in a general way, how to confer with each student privately and to encourage students to take pride and pleasure in their reading. Similarly, the BR teachers ran their groups with considerable ability, teaching the skills in a sequential order. However, most of the IR teachers never achieved much with a "sharing" or "reporting" program, nor did most of the BR teachers go very far with a literature program or programs to enrich the basal materials. One could say, with some fairness, that these deficiencies on each side tended to balance each other out; none of the teachers achieved the optimum possible with the method taught, but all of them did quite well with the basic features of the program. (Hoihjelle, 1961, p. 7; Carline, 1960, p. 70)

But the relative purity of any teaching method in any research is subject to a number of qualifications. Instruction, as Broudy says, has both direct and indirect outcomes. Simple studies, such as Buckingham's (in Hunnicutt & Iverson, 1958, pp. 419-421), concern themselves with the question, "Did the student learn the prescribed factual information or skill?" Even such situations are much more complex than they seem on the surface (see infra. discussion this chapter of teacher personality and "style"). But instruction aimed at more complex learnings and skills, such as those sought in the present experiment, can be more appropriately labeled "indirect." These skills cannot be so easily taught, nor is it so easy to detect whether they have or have not been learned. (Broudy, 1963, pp. 39-40; Bloom, 1956)

In this study, the methods of teaching reading were imposed ad hoc. Wallen and Travers discuss this matter of the means by which teaching methods are introduced into a research study. Little evidence, they say, has been produced "...to show that teachers actually switch from one pattern of behavior to another...such a switch is far from easy." (Gage, 1963, pp. 467-470) The investigator has fairly good evidence on this point: visits to each classroom in the study a number of times during the reading period, and written accounts of each visit. (Appendix 3) Except for the classes eliminated from the study, the teachers did teach by the method prescribed. For those teaching BR, this was a continuation of the method by which they had taught previously; if they made changes to more exactly conform to the investigator's suggestions, they were not nearly as major as a change to a different teaching method. For those teaching IR, the change was major. But all of those teachers had previously considered some substantial change in their mode of teaching reading; thus, it may not have been so difficult for them to make the changes suggested. (Hoihjelle, 1961)

For the teachers in the TP group who taught by both methods, the problem was of quite manageable proportions; in their departmentalized schools, they taught several classes of reading daily, they continued to teach most of their classes by the method to which they were accustomed, and taught only one period each day by the X method. Psychologically, they were not risking very much, either in terms of their personal commitment, or in terms of endangering the normal progress in reading of large numbers of students. The three teachers in this group were very conscientious about making a clear differentiation between the two methods. In both the final groups used, the RA and the TP groups, the children experienced the type of reading instruction which was specified.

Three other objections can be made about the teaching method and the outcomes.

11. As a result of teacher bias, the assigned method might be slighted.

12. Teacher personality would necessarily intrude.

13. Regardless of teaching method, each teacher has her own "style" and this style might be of considerably greater influence on the results than any specific teaching method.

All three of these points should be kept in mind when reading the section on "equivalence" of the teachers paired with each other.

11. Possible teacher bias: Each teacher in the study had definite opinions about IR and BR; some clearly preferred one to the other, and a number had mixed feelings. (Appendix 6) These same feelings were expressed verbally to the investigator, and in some cases to the building principals. There can be no doubt that these opinions influenced the behavior of the teachers, and hence the experiences the child had.

12. Teacher personality:

&

13. Teacher style: These points are closely related. Each teacher does have personality traits and something of a characteristic pattern of behavior in the classroom which could be called a "style." Washburne and Heil found that 4th, 5th and 6th grade students respond to their teachers in terms of teacher personality as displayed in the classroom. Many studies using the MMPI and other instruments tend to have conflicting or inconclusive results, but the phases of the Teacher Characteristics Study concerned with elementary teachers tend to show relationships between teacher personality or style and student behavior in their classes. I believe that teacher personality, or style, did make a difference in this study. (Gage, 1963, pp. 532-554 and 566-570; Hughes, 1964)

Were the paired teachers "equivalent?" To what extent would non-equivalence invalidate the findings of this study? No pairing using the bases of matching applied in the RA group here could claim to get "equivalent" pairs -- merely pairs that are roughly equivalent in certain respects, but respects which do not take into consideration a number of important characteristics that are highly relevant to the performance of the teacher. This includes personality characteristics.

As concluded in the previous section, personality traits and a characteristic style of a teacher do make a difference in the classroom, possibly a greater difference than a method of teaching reading.

In the TP group, the situation differs in that each teacher is compared with herself. In this case, we have as close equivalence as possible. However, the factor of subjective preference for one of the two teaching methods could still enter to make the comparison one of non-equal performances, the preferred method receiving preferential attention.

SUMMARY

Chapter IV has discussed the following points:

1. For those interested in the causal relationships of variables in a teaching situation, experimentation provides no sure explanations, no certainty beyond a reasonable doubt. But it may give useful information that can lead to professional improvement.

2. Twenty-nine teachers in five San Francisco Bay Area school districts agreed to participate in this study. Prior to and during the 1963-64 school year, these teachers received instructions as to how to teach reading by the IR method, or to teach more effectively by the BR method. Twelve teachers paired according to similar years of teaching experience formed the RA group, while three TP teachers taught one class by each of the two methods. Students took tests in September and October, 1963 and in May, 1964; between the tests, they studied reading by one of the two methods.

3. All the variables that may influence the outcome of this research are not known. Of the variables that can be identified, one group raises questions about the internal validity of the experiment, and may influence the results:
   (a) Other events besides the experimental variable occur between pre- and post-testing.
   (b) Physical and mental growth of the subjects.
   (c) The effects of testing on later testing.
   (d) The possibility that the subjects may represent a "biased" or selected sample of the general population of students in the U.S.; children from different socio-economic backgrounds may react differently to the experimental variable and to testing.
   (e) Differential loss of subjects from the X and C groups.

4. A second group of variables may make a difference in the interpretation of the experiment: factors which cause one to question the applicability of the findings to other groups of subjects or other sets of circumstances:
   (a) Interaction between the selection of the subjects and the experimental variable.
   (b) Reaction of subjects to the arrangements of the experiment: the Hawthorne effect.

5. Regarding the validity of the Torrance and Covington tests, the reader is referred to pages 18-21 where they are described and defended.

6. Although there are reasons for doubting the "purity" of the methods of teaching reading (as there are in every experiment involving teaching methods), I have some evidence that the teachers did teach by the prescribed methods: written records of at least five visits to each participating classroom.

7. Teacher bias may have affected the outcome, and teacher personality and "style" would have some influence on the results.

8. The null hypotheses to be tested in this study may be stated as follows:

   (1) There will be no difference in the number of books read by children in the two programs of learning to read.

   (2) The children in the two programs will not differ in gains or losses on "generation of ideas" (creativity) tasks, or on verbal problem-solving tasks, when post-test scores are compared with pre-test scores.

   (3) Boys will not differ from girls on number of books read, or on the creativity or problem-solving tasks.

CHAPTER V

THE RESULTS OF THE EXPERIMENT: TREATMENT AND INTERPRETATION OF THE DATA

A. Handling the data: Processing up to the point at which statistics were used.

During the summer of 1964, scoring of the tests was done by David Thatcher and Miss Wendy Bearg, a graduate in psychology at the University of California who was trained for this job. The two scorers practiced scoring on the tests of subjects whose tests were not being included in the analysis of the data, and compared interpretations of the scoring keys. Several conferences were held to agree upon "ground rules" for scoring. Difficult questions on scoring were referred to Martin Covington. (Appendix 9)

Thatcher scored all of the "Squares" and "X-ray" tests, and Miss Bearg scored all the other tests. To prevent bias about the experimental method from influencing the scoring, all tests scored by Thatcher were "blinded": blank paper was stapled to the front of each test booklet, and the booklets were opened in such a way as to avoid seeing the identification on the front page. Piles of blinded tests were mixed together so that tests from four or more classes were being scored in something like random order. Scores were written on the blinding sheets, and were later transferred to tally sheets. To prevent operation of bias in scoring by Miss Bearg, the identity of the X and C classes was withheld from her until the scores had been entered on the tally sheets.

Dr. Covington's scoring keys were used for the Torrance tests as well as the Covington tests. For 5th and 6th grade students, Dr. Covington had based his keys on the performance of large numbers of students. Also, it was desired to make the results of this study comparable to other work by Covington. Dr. Covington was consulted as to what scores should be extracted from each test booklet. It was decided that, although this would be only a small portion of the information available, two things should be scored: number of ideas each child generated, and total points earned by the child. The latter score represents the sum of the points assigned to each of his ideas. Since ideas earned between zero and 4 points on the problem-solving tests and zero and 2 points on the creativity tests, quite a range of scores resulted. A few students generated no recognizable ideas, or none that earned above zero, and hence were scored "0 - 0". At the opposite extreme, one student in the "toy truck" creativity test in the spring thought of 35 scorable ideas and earned 9 points. Very few students earned over 10 points, either spring or fall, on the problem-solving tests, and the limited range of scores may be worth remembering in interpreting the results.

The key-punching was done under the direction of Thomas J. Shuell. Mr. Shuell, at present a graduate fellow in the Institute of Human Learning at the University of California, Berkeley, prepared the programs for the computer, and assisted in the handling and interpretation of the data.

B. Findings on the "Books Read" phase of the Study

To analyze the relationship of method of reading to number of books read, the Chi-square test of independence was used. A scattergram of the number of books read by 426 subjects in the RA and TP groups showed that the distribution was very skewed, and hence the assumptions for parametric statistics were not met. The hypotheses state that the number of books read is independent of method by which the child learned reading, is independent of reading achievement, and is independent of sex. Alpha was established at .05. In the event Chi-square shows significance at the .05 level, H_o would be rejected. (Marascuilo, 1963)

After tallying the number of books read by each child, these were arrayed from largest number to smallest, regardless of whether the child was in an X or C class. Dividing the number of students into approximate thirds, each student was assigned to a "high," "medium," or "low" category according to the number of books read by that child. The fractions at the boundaries of several of the ranges resulted when each array was divided into thirds. Many children, in accordance with the instruction sheet for number of books read, did report reading fractional parts of books. (Appendix 1) The 2 x 3 and 3 x 3 comparisons are shown in Tables 4 through 12. The numerals represent the observed cases in each cell, while the numerals in parentheses show the expected value in each cell. (Appendix 8)

Table 12 summarizes the results of the Chi-square calculations.

TABLE 12

COMPARISONS OF NO. OF BOOKS READ CHI-SQUARE TESTS OF INDEPENDENCE: SIGNIFICANT DIFFERENCES

Group	x^2 value	d/f	Significance	Favors
Method: (IR vs. BR)				
Randomly assigned, grade 5	27.99	2	Yes, .001 level	X students
Randomly assigned, grade 6	2.47	2	No	--
Teacher preference	50.02	2	Yes, .001 level	X students
Achievement: (high, med., low achievement vs. high, med., low no. of books read)				
Randomly assigned, grade 5	8.78	4	No	--
Teacher preference	2.39	4	No	--
Sex: (boys vs. girls)				
Randomly assigned, grade 5	10.61	2	Yes, .01 level	Girls
Randomly assigned, grade 6	4.56	2	No	--
Teacher preference	10.02	2	Yes, .01 level	Girls

The X students in the RA group, grade 5, read significantly more books than the C students, but in the grade 6 part of the RA group, the C students came much closer to reading as many books as the X's. In the TP group, where the most dramatic differences appeared, the IR subjects read a great many more books than the BR subjects. It is concluded that, in two out of three cases, the null hypothesis is rejected, and it appears that IR students read more books than BR students.

When we compare the child's amount of reading with his achievement, we find that the high achievers do read more books than the low achievers, but differences do not reach significance. Hence, the evidence here supports the null hypothesis. Girls, in the 5th grade classes in the RA group and in the TP group, exceeded boys in the number of books read during the year. However, the 6th graders did not show differences favoring either boys or girls. In the case of the 5th graders, in both the RA and the TP group, the conclusion is that the evidence overturns the null hypothesis, but that in the 6th grade classes, H_o is sustained. (Hays, 1963, pp. 336-348)

C. Findings on Creativity and Problem-Solving

1. The analysis of the data for the TP group

Examination of fall standardized test scores revealed distinct IQ and reading schievement differences within each class in the TP group, and between the classes in the group. When such differences between subjects on criteria other than the dependent variable are suspected of having an influence on scores on the criterion measures, an attempt must be made to control these differences. If such influences are not controlled, the presence or absence of differences between groups being compared on the basis of the criterion cannot be specifically attributed to the treatments being tested. To provide a means of attaining a measure of control over such differences, the analysis of covariance statistic was used. The particular covariance design used acts to adjust the differences which occur between X and C groups on the spring creativity and problem-solving tests by regression on the pre-test scores, and to test the significance between these adjusted means. In other words, it answers the question: what would the spring criterion means have been had there been no difference in pre-test scores between the IR and BR students, and is the difference between these adjusted spring means significant? (Wert, Neidt, & Ahmann, 1954, p. 343; Lucow, 1964; Appendix 2)

In the TP group, fall 1963 IQ and reading achievement scores, as well as fall Torrance and Covington test scores, were used as covariates. The fall Torrance tests were equivalents to those given in the spring; the identical Covington tests were given fall and spring. Because of the unequal cell frequencies, the program used for the computer was BMD 05V - General Linear Hypothesis - Version of April 27, 1964, developed at the Health Sciences Computing Facility, University of California at Los Angeles. The data, as well as the other data handled by computer, were processed by the IBM 7094 computer at the University of California Computer Center, Berkeley.

The F tests for regression to determine which covariates were significant predictors of the criterion showed that fall IQ and achievement tests were not significant predictors, but that fall creativity and problem-solving tests were significant predictors. Hence, the data were re-run using the criterion test scores as the covariates. The results appear in tables 13 through 20. For each of the four tests, two tables, one for number of ideas generated and one for total points earned, show the outcomes. (Appendix 8)

In order to determine which of the sub-comparisons were significant, it was necessary to compute:

$\bar{X}$, the fall mean for each cell (treatment or condition)

$\bar{\bar{X}}$, the fall grand mean

$\bar{Y}$, the spring mean

$\bar{Y}'$, the spring adjusted mean, found by the formula

$$\bar{Y}' = \bar{Y} - \beta(\bar{X} - \bar{\bar{X}}),$$

where β represents the overall estimate of the regression coefficient within each cell.

Since the decision rule was to sustain the null hypothesis unless the difference reached the .05 level of significance, the appropriate F values used were:

$$F_{1}, \underset{\sim}{200} \cong 3.87$$

$$F_{2}, \underset{\sim}{200} \cong 3.03$$

$$F_{4}, \underset{\sim}{200} \cong 2.40$$

Tables 13 through 20 show that, in a number of instances, the overall F showed significance. The job then becomes calculation of the means and variances of the contrasts between appropriate sub-groups to determine in each case whether the contrast is or is not significant.

The variance of the contrast (ψ) is found by the following formula:

$$\text{Var} = \sqrt{\text{MSE}' \left[\frac{1}{N_1} + \frac{1}{N_2} + \frac{(\bar{X}_1 - \bar{X}_2)^2}{E_{xx}} \right]}$$

where MSE' stands for the adjusted mean square error, and E_{xx} the error sum of squares for the fall scores. The resulting number, multiplied times the square root of the degrees of freedom associated with the test that was conducted, gives the comparison value. This value is compared to the difference between the appropriate spring adjusted means. In the event this difference equalled or exceeded the comparison value, the result was judged to be significant. If it was less, it was judged to be not significant. In cases where there was only one possible source of difference (i.e. 5th grade vs. 6th grade) this was read directly from the table prepared by the computer.

Each teacher in the TP group taught two 5th grade classes. For analysis of the findings on creativity and problem-solving, each X class is paired with a C class. Each pair of classes is "nested" within grade 5.

The analysis of covariance, using a multiple classification, examines the relative influence of the independent variables on the scores on the criterion tests. Using fall scores on these tests as the covariate, comparisons were made between the two methods of teaching reading, between the three pairs of 5th grade classes, and between boys and girls. In addition, interactions between these independent variables were calculated. (Hays, 1963, pp. 484-485; Wert, Neidt, & Ahmann, 1954, pp. 352-362) Those instances in which the differences between variables proved to be significant are shown for each problem as follows:

TABLE 21

COMPARISONS OF SUBJECTS ON CREATIVITY AND PROBLEM-SOLVING TESTS: INSTANCES IN WHICH THE DIFFERENCES WERE SIGNIFICANT

Teacher Preference (TP) Group
Analysis of Covariance

#1 Toy Dog/Toy Truck, Ideas	
(1) Between pairs:	Pair 1 exceeded Pair 3
(2) Between sex:	Girls exceeded boys
#2 Toy Dog/Toy Truck, Points	
(1) Between treatment:	X students exceeded C students
(2) Between sex:	Girls exceeded boys
#4 Circles/Squares, Points	
(1) P X T:	X students in Pair 2 exceeded C students in Pair 2
#5 Elevator, Ideas	
(1) Between treatment:	X students exceeded C students
(2) Between pairs:	Pair 1 exceeded Pair 2 Pair 1 exceeded Pair 3
(3) Between sex:	Girls exceeded boys
#6 Elevator, Points	
(1) Between treatment:	X students exceeded C students
(2) Between pairs:	Pair 1 exceeded Pair 2 Pair 1 exceeded Pair 3
#7 X-Ray, Ideas	
(1) Between treatment:	X students exceeded C students
(2) Between pairs:	Pair 1 exceeded Pair 2
(3) Between sex:	Girls exceeded boys
#8 X-Ray, Points	
(1) Between treatment:	X students exceeded C students
(2) Between pairs:	Pair 1 exceeded Pair 2 Pair 3 exceeded Pair 2

It is noteworthy that in five of the eight comparisons, the X group scored significantly better than the C group, while in no instance did the controls do better than the experimentals. However, there may be a number of explanations for this result in addition to the one that attributes the difference to method of reading instruction. In all three pairs of classes, the teacher chose to give the X treatment to the "better" class within the pair; "better" here means the class which had higher scores on IQ and reading achievement tests, and which had been expected to achieve better in the strict homogeneous grouping plan used by the district. Even though IQ and reading achievement were not significant predictors of spring criterion test scores, it may be that some other, unmeasured variable (such as interest or motivation) might have favored the students who did in fact score higher on IQ and achievement tests, and have resulted in the differences on the criterion measures. In addition, note the relative performances of the two classes in Pair 2: the C class was consistently surpassed by the X class, frequently by margins approaching 2 to 1. While noting the superiority of the X students, this will be interpreted as evidence to cast doubt on H_o, but not to reject it.

This conservative conclusion about the effect of treatment is partly substantiated by further consideration of the findings on pair comparisons. For example, in four of the cases, Pair 1 exceeds Pair 2, in one case Pair 3 exceeds Pair 2, while in no case does Pair 2 exceed either of the others. The relatively low scores of the C class within Pair 2 accounts for a considerable portion of these deficits.

The four cases in which the girls exceeded the boys provide considerable reason for doubting the null hypothesis as to sex differences. While this may not justify outright rejection of H_o, it would certainly cause us to question it. It seems possible that 5th grade girls do better than 5th grade boys on the creativity and problem-solving tests used in this experiment. Further research on this point would seem to be justified. (Covington & Crutchfield)

2. Multiple regression in the RA group

Not all the subjects in the RA group took the same standardized IQ and achievement tests. Students in one school district had the Kuhlmann-Anderson intelligence test and the Stanford Achievement Test, while in two others the California Test of Mental Maturity and the California Achievement Test were used. It became important to determine which variable or variables to use as the covariate in the analysis of covariance. Four fifth grade classes comprising two pairs from the RA group had had the same standardized IQ and achievement tests, the California Test of Mental Maturity and the California Achievement Test. Punched IBM cards with these two test scores for each child plus fall and spring scores on the creativity and problem-solving tests, were prepared. Mr. Shuell programmed the data using program BIMD 06, Multiple Regression Correlation Analysis, University of California at Los Angeles, 1961.

The only consistently significant variable turned out to be fall test scores. Hence, it was used as the covariate in the analysis of covariance. Tables 22 through 29 give the regression coefficients. (Hays, 1963, pp. 490-527; Appendix 8)

3. Data of the RA group: creativity and problem-solving

Each pair of teachers in the RA group taught a 5th grade class or a 6th grade class For purposes of analysis of the findings on the creativity and problem-solving tests, each class of students occurs in the study only in association with one grade or the other. Further, each X class is paired with a C class. Each pair is "nested" within grade 5 or grade 6; each student in the experiment belonged to either a 5th grade or a 6th grade class. This nested design, which has been used in recent education experiments, was utilized in programming for the computer. (Hays, 1963, p. 387; Gage, 1963, pp. 199-201; Lucow, 1964)

As will be remembered, each teacher in the randomly assigned group was paired with another teacher according to teaching experience and principal's rating. The flip of a coin decided which teacher would teach by the experimental method and which by the control method.

The analysis of covariance, using a multiple classification, examines the relative influence of the independent variables on the scores on the criterion tests. Using fall scores on these tests as the covariate, comparisons were made between the two methods of teaching reading, between students in the two grades, between the three pairs of classes within each grade, and between sexes. Because of the unequal cell frequencies, the program used for the computer was BMD 05V - General Linear Hypothesis, mentioned above in discussing the TP group. (Wert, Neidt, & Ahmann, 1954, pp. 352-362)

The computer printouts gave the differences between the various factors on each of the eight problems, i.e., "Circles/Squares, ideas generated." Tables 30 through 37 were constructed, one for each of the eight problems. (Appendix 8)

The same calculation of the contrast ( ) and adjusted spring means were made for the RA scores as for the TP scores (supra). Table 38 presents the significant differences.

TABLE 38

COMPARISONS OF SUBJECTS ON CREATIVITY AND PROBLEM-SOLVING TESTS: INSTANCES IN WHICH THE DIFFERENCES WERE SIGNIFICANT

Randomly Assigned (RA) Group
Analysis of Covariance

#1 Toy Dog/Toy Truck, Ideas	
(1) Between grades:	Grade 5 exceeded Grade 6
(2) Between treatment:	Grade 5 C exceeded Grade 5 X
(3) P X T:	Pair 3, C exceeded X
#2 Toy Dog/Toy Truck, Points	
(1) Between pairs:	Pair 5 exceeded Pair 6
(2) P X T:	Pair 3, C exceeded X
#3 Circles/Squares, Ideas	
(1) Between grades:	Grade 5 exceeded Grade 6
(2) P X T:	Pair 1, X exceeded C
	Pair 3, C exceeded X
#4 Circles/Squares, Points	
(1) Between grades:	Grade 5 exceeded Grade 6
(2) P X T:	Pair 1, X exceeded C
	Pair 3, C exceeded X
(3) P X T X S:	Pair 1, X boys exceeded C Boys X girls exceeded C girls
#5 Elevator, Ideas	
(1) Between grades:	Grade 5 exceeded Grade 6
(2) P X T:	Pair 2, X exceeded C
	Pair 3, C exceeded X
#6 Elevator, Points	
(1) Between grades:	Grade 5 exceeded Grade 6
(2) P X T:	Pair 2, X exceeded C
	Pair 3, C exceeded X
#7 X-Ray, Ideas	
(1) Between pairs:	Pair 5 exceeded Pair 6

As in the case of the TP group, the results appear categorical. The differences between X and C are few, considering the number of comparisons made. We would be justified in saying that the evidence sustains H_o.

Comparisons between pairs of classes, never of central importance in this study, can be ignored. Pair-treatment interaction, however, is important. Note that the greatest number of such significant interactions favor the C students over the X students in Pair 3. Although the two teachers in this pair were fairly matched, the students came from very unequal backgrounds, and more will be said about this in Chapter VI.

The other difference worthy of note in the RA group on the creativity and problem-solving tests is the one between students in grade 5 and students in grade 6. Since all the significant differences favor the 5th grade subjects, it seems likely that 5th graders do make greater gains in a school year than do 6th graders in acquiring or improving those skills helpful on the Torrance and Covington tests. This tends to confirm one of the conclusions of Covington in his 1964 study. (Covington & Crutchfield)

D. Questionnaire for teachers

During the month of April, 1964, a questionnaire devised and used by the New York City schools was distributed to all teachers in this study who had taught by the IR method. This included the three TP teachers, three 5th grade teachers in the RA group, and three 6th grade teachers in the RA group. Distribution in April allowed teachers approximately 6 weeks in which to respond. An accompanying form letter instructed teachers in the completion of the eleven page questionnaire. (Appendix 6)

Part I invites comment on many apsects of IR with especial emphasis on probing ways in which the teacher "makes sure" the students are learning from IR. Part II asks the teacher to vote as to which method, IR or BR, accomplishes the best results for students, and to comment if she wishes to do so. In tabulating the questionnaires, I recorded a number of the comments as well as the votes.

The report will not show the same number of responses to each question, since not all teachers responded to all questions; occasionally a teacher responded with a "?", or left the answer blank.

Some responses were in terms of conventional means of "checking on kids" or "making sure," while others were more related to the rationale of IR as outlined in Chapter 3. Examples of the former: in reply to the second question (How and when do you check on vocabulary?), several teachers stated that students keep a vocabulary notebook, and/or that the teacher notes his use of vocabulary in oral reading. Examples of the latter: in reply to the fourth question (What do you do when children list words they do not know and then do nothing about them?), one teacher said that, if the child comes upon too many difficult words, then the teacher should suggest he shift to an easier book. Another suggested that the teacher find ways for children to become involved with words, an apparent recognition of the fact that in the last analysis, it is the child who will learn the meanings and usages of words.

The simplest way to report the results of Part II is to say that the nine teachers voted heavily in favor of IR. Of 45 items in Part II, their vote favored IR 44 times and BR once. Most of the 44 times the vote favored IR by margins of 7-0 or more. The one time BR was favored (by a 5-3 vote) was on Question 4, item 4.1: "4. Regardless of approach, all children must be able to read aloud effectively. This essential is commonly called good Oral Reading. Which program affords maximum opportunity for the child to: 4.1 Read before an audience and keep them interested."

From the responses on the questionnaires, a number of generalizations may be made. These teachers used a variety of techniques in teaching reading, and it appears that they have many skills. While not always certain of their own rightness, they tend to be confident. They proposed and/or used a variety of solutions to the tough problems posed by the questions, as, for example, Question 3 in Part I which asks: "How do you ascertain that the children are really using word-recognition techniques and are not just developing careless habits of silent reading?" Six practical ways of determining the child's word-recognition skills were suggested. These proposals show, also, that these teachers are eclectic and pragmatic: they use techniques from Durrell, the SRA reading kits, and the Ginn workbooks, as well as from the proponents of IR. And they want a technique that really works for them, regardless of its author.

But how about the motivations of these teachers in responding to the questionnaire? I know that all who were asked did fill out a lengthy questionnaire, a job which must have taken a minimum of one hour, and probably up to three hours for some respondents. Why did they respond as they did? It may have been a genuine commitment to IR; in one case I know this to be true because I contacted the teacher a year after the end of the experiment and found her just as keen on IR as she had been before. For others, perhaps the immediacy of using IR affected their replies, or possibly they showed initial enthusiasm for a method new to them. Some respondents, I believe, indicated some degree of disillusion with BR.

As discussed in Chapter 4, it seems likely that teacher personality played a part in the responses to the questionnaire; some teachers tend to be more critical of the status quo; some tend to be more venturesome in trying and defending new methods. It should be remembered, too, that some of the teachers may have felt a desire to please me.

The responses include many reiterations of the main arguments in favor of IR: self-selection of reading matter, self-pacing, freedom to adapt modes of reading, and the tremendous enjoyment expressed by so many children in an IR program. As one teacher said in response to the last item on the questionnaire (Be completely absorbed in what he reads?), "Watch them and you'll see!!" (Appendix 6)

SUMMARY

To summarize Chapter V, here are the most important findings in this research:

1. Chi-square tests of independence showed that the 5th grade students in an IR program, those in both the TP group and the RA group, read significantly more books than students in a BR program. They showed that numbers of books read is independent of reading achievement as measured by standardized reading test scores, and that girls tend to read more books than boys.

2. Multiple regression in the RA group showed that fall test scores, the only consistently significant predictor of spring scores, would serve as the appropriate covariate in the analysis of covariance on the creativity and problem-solving scores.

3. The analysis of covariance tended to sustain the null hypothesis: method of reading did not prove to be significantly related to creativity and problem-solving performance. However, the results in the TP group tend to cast doubt on the hypothesis.

It seems possible that other forces, such as interest, may have affected criterion test scores.

4. The 5th grade students did significantly better than the 6th grade students in five out of eight of the problems: Toy Dog/Toy Truck, Ideas; Circles/Squares, Ideas and Points; Elevator, Ideas and Points. This was in the RA group only. This would tend to cast doubt on the null hypothesis.

5. The other most interesting covariance finding was that in four out of the eight problems in the TP group, girls scored higher than boys. This leaves the null hypothesis in doubt.

6. In general, it would have to be said that the IR subjects read significantly more books than BR subjects, but that the results of the creativity and problem-solving tests were equivocal. The RA data do not support the superiority of girls found in the TP group. And since there were no 6th grade classes in the TP group, it was impossible to see whether the tendency toward superiority of 5th graders over 6th graders found in the RA group would be supported or not. It seems that the evidence does not provide unequivocal answers on which to base decisions about instructional programs in reading.

7. According to a questionnaire filled in near the end of the school year, the nine teachers who used IR liked it, and felt it did a better job than BR in meeting the needs of students.

CHAPTER VI

DISCUSSION OF THE FINDINGS, AND RECOMMENDATIONS FOR FUTURE RESEARCH

> "It is the investigator's duty to reveal all pertinent conditions, favorable and unfavorable, surrounding the study and to report his impressions as well as his findings; and then it is up to the reader to decide how much stock to put in the conclusions presented."
> (Lucow, 1964)
>
> "...the conclusions in any study probably can be applied only to the reading of groups like the one measured." (Hunnicutt & Iverson, 1958, p. 146)

A. Review of the procedures followed in this experiment

This study compared individualized reading with basal reading. Fifth and sixth grade students took Torrance creativity tests and Covington problem-solving tests in September-October of 1963 and May 1964. A list was kept of all books read by the subjects during the school year. Fifteen teachers were divided into a randomly assigned (RA) group and a teacher preference (TP) group. The RA teachers were paired according to rated competence and years of experience; a coin was flipped to decide which teacher would teach by IR and which by BR. Each TP teacher taught two classes, one by each of the two methods.

All teachers participated in pre- and in-service training, and used a mobile professional library. The investigator visited each class a minimum of five times during the year.

The null hypothesis stated that method of reading would not cause students to differ on year-end creativity or problem-solving tests, or in the number of books read during the year.

Alpha was set at .05. The Chi-square test of independence was used to compare the number of books read. A multiple regression and the analysis of covariance compared the performance of groups and sub-groups on the creativity and problem-solving tests.

B. Summary of the findings

1. Number of books read

In the RA group, the 5th graders in the X classes read significantly more books than the subjects in the control classes. The X students in the TP group also exceeded the reading of the C students by significant amounts. However, although the X students in the RA group, grade 6, read more books than the C students, the difference was not significant. In the comparison of students' achievement with number of books read, the evidence supported the null hypothesis: achievement and number of books read appear to be independent of each other. Significant sex differences appeared in the 5th grade RA group and in the TP group in which girls read substantially greater numbers of books than boys. However, in the RA group at 6th grade level, no differences reached the .05 level.

2. Creativity and problem-solving

Multiple regression showed which variables to use as the covariates in the analysis of covariance: using criterion scores and IQ and reading achievement scores of the 5th grade RA group, only fall criterion scores were a consistent predictor of spring criterion scores. In the analysis of covariance for the whole RA group, most differences between X and C students were not significant. Of those that were, a greater number favored the C students than favored the X students. However, the appropriate conclusion seems to be that the results are ambiguous. None of the boy-girl differences, per se, were significant. However, in five of eight comparisons, the 5th grade students exceeded the 6th grade students by significant amounts.

In the analysis of covariance for the TP group, the X students scored significantly higher than the C students in five of eight instances, while the C students did not score higher on any of the tests. This seems to justify doubting the null hypothesis: in fact, IR may have made a difference in student ability on creativity and problem-solving tests. The other notable difference in the TP group was between boys and girls. Girls scored significantly higher than boys on four of eight tests, while boys never scored significantly higher than girls. Again, there may be sufficient reason to doubt the null hypothesis that sex makes no difference.

C. Discussion of some of the results

1. In the RA group

It seems to me that there may be alternate explanations for some of the results: specifically, the significant differences in the RA group favoring the C students. One particular pair of classes, Pair 3, accounted for six of seven instances in which C margins of superiority were significant. In comparing these two classes, the two teachers were, in my opinion, very well matched. (See supra, Table 1, Teacher X-3 and Teacher C-3) However, the two groups of students differed greatly. Observation of the communities showed that the socio-economic level of the two was widely different. Teacher C-3 had a class with high morale, a class which showed enthusiasm for any reading activity suggested by the teacher, reflecting the supportive values and attitudes of middle class homes. By contrast, in a school that has 70% Negro students, Teacher X-3 had a number of children who showed little interest in school. The class had a large and varied collection of books -- 334 on November 20, 1963 -- but some children made little use of it. Whether the determinant was poverty, family mobility, a series of unhappy experiences with school (and especially with reading), or an accumulation of several factors, was beyond the scope of this study. As Sarvis has said, it is hard to overestimate the degree of alienation of the "deprived and persecuted" children in some of our schools. These students did not respond to reading as favorably as the class with which they were matched. (Sarvis, 1962; Visit X-3-5)

Could it be that the Covington tests favored students with large vocabularies, with ability to spell, with verbal fluency, and with confidence in their ability to communicate their ideas on paper? Some slight evidence on this question is found in the following additional comparison of the two classes in Pair 3.

The mean number of words written by the students in the class taught by Teacher X-3 on the spring Elevator test was 89.19 and on the X-Ray test was 65.04. Compare this with means of 103.2 and 126.42 on the same two problems for the students of Teacher C-3 and it will be seen that verbal facility is of importance. The student who writes more words tends, on the average, to earn a higher score. The means of the two classes on the four spring tests are as follows:

	Elevator Spring Means		X-Ray Spring Means	
	Ideas	Points	Ideas	Points
Teacher X-3	2.90	6.20	1.65	3.13
Teacher C-3	6.00	13.13	3.00	4.83

Pair 1, in which the X students exceeded the C's twice, consisted of two classes very evenly matched as to interest, scholastic aptitude, and socio-economic background. No significant differences appeared in the comparisons between X and C subjects in Pair 5 -- both classes with low socio-economic background. Comparisons of classes from very different backgrounds may give misleading conclusions. (California Elementary School Administrators Association, 1962; supra, p. 43)

Other differences appear in the data, including grade level differences. In five out of eight instances, the 5th grade students exceeded the 6th grade students in scores on the Torrance and Covington tests. As will be noted by referring to Table 38, three of these cases involved generation of ideas and two involved the quality of the ideas generated. Is it perhaps true that 5th graders may be expected to perform better than 6th graders on the Torrance and Covington tests? Torrance says that children in grades 1, 2, 3 increase rather steadily in their mean scores on the Minnesota Tests of Creativity. Then, between 3rd and 4th grade, there tends to be a decline in scores, followed by some recovery in grades 5 and 6 back to the 3rd grade levels of achievement. In the two main studies by Covington, the 5th grade subjects made greater gains than the 6th graders. Thus, previous studies lend credence to the plausibility of grade differences, differences in which younger students may excel over older ones. Future research may give further insight into age-as-a-factor-in-performance on these tests. (Torrance, 1962, pp. 93-97; Covington & Crutchfield)

Getzels and Jackson, and Torrance, gathered evidence on the relationship between IQ, achievement, and creativity. While not central to this study, this relationship did receive attention. The multiple regression performed on two of the pairs of classes in the RA group showed that neither IQ nor reading achievement was a dependable predictor of spring test scores on the Torrance and Covington tests. In the TP group, analysis of covariance showed that the range of creativity and problem-solving scores was not tightly linked to the corresponding IQ or reading achievement scores of the subjects. In both cases, present findings tend to support those of Getzels and Jackson, and Torrance. (Getzels & Jackson, 1962; Torrance, 1962)

On the tests as presently constructed and with present time limits, a substantial number of children make high scores the first time they take them. These same children may find it very difficult to exceed their first performances. Theoretically, the only limit to performance on Torrance and Covington tests would be the limitations on the child's ability to write words or make drawings in the time allowed. But, practically, the child faces several problems. First among these is adjusting to the unusual demands of the tasks. Dressel and Mayhew refer to this as the effect of familiarity/unfamiliarity with the terminology, concepts, format or content of the materials with which the student must deal. The child who sits, bewildered, will make little headway on the test paper. The child who is unable to focus -- perceptually and physiologically -- on a number of items serially in a brief span of time, will not be likely to score many points. Speed of reaction, perseverance, and other morale factors affect performance on tests. (Gage, pp. 388-389; D. M. Johnson, 1955, pp. 74-79, 95-97, 233-234, 266; supra, pp. 19 and 24-26)

A second phenomenon which may influence scores on such tests as these is the tendency for scores to regress toward the mean. This has been noted on standardized IQ and achievement tests. Is it true that a number of children who scored high on the fall tests regressed toward the mean on the spring tests? It would be a worthwhile supplemental analysis to seek an answer to this question. If it proved to be true, then one would need to modify hypotheses about any differences that might be thought to be due to grade level, sex, or the experimental treatments.

Although considerable thought preceded the decision to score only number of ideas generated and points earned by those ideas, is it perhaps true that I did not choose the most significant aspects of the children's test performances for scoring? I wanted to find out if a freer and more individualistic approach to reading would increase the child's imaginative awareness and his courage in dealing with what, for many children, would be unusual tasks. Apparently, the influence of IR was insufficient in a one-year period to cause this change. But, it is possible that a different and more detailed analysis of the same test data would yield a different result. So much depends on what you try to find out from a particular set of tests that can be scored in several ways. (Smith & Tyler, 1942; supra, ch. 4, sec. H.3)

Two final, and related points may be made about the results on the creativity and problem-solving tests. The X children did, in almost all cases, at least as well as the C children. This in itself is encouraging, particularly if we remember that none of the teachers who taught IR during the 1963-64 school year had had previous experience teaching by that method. Also, none of the X students had had IR before the 1963-64 school year.

2. In the TP group

Each of the TP teachers elected to give IR to his top ability class, and to give BR to the second class in ability. Appendix 2 shows that, in all three pairs, the X class exceeded the C class on the Iowa Test of Basic Skills, and the margins of TP X-8 over TP C-8 in both vocabulary and comprehension are especially large. It could be hypothesized that the three X classes had a "head start" over the C's in reading, and this would cast doubt on any conclusions regarding treatment. One other factor, however, would be of less importance in the interpretation of the TP results than in the RA results: socio-economic background. Each pair of classes was within a single elementary school, and all three schools were in neighborhoods which appeared to be very similar.

Since each TP teacher taught both classes in a given pair, and since both classes were in the same school, the gross discrepancies noted above in Pair 3 of the RA group are not found in the TP group. However, the questions raised above about size of the subject's vocabulary and verbal fluency could be raised here in considering the results for the TP group. Since all the TP students were in grade 5, no grade level differences were possible. However, the comments about a "ceiling" on the Torrance and Covington tests, about the effect of unfamiliarity with such tests on student performance, and about regression toward the mean would apply just as well in considering the TP results as they did in the discussion of the RA results. It would seem advisable that further research be done to explore the effect of these variables before concluding that treatment or sex are significant factors in such comparisons as the present investigation.

Table 39 (below) presents a summary of those cases in which significant differences appeared in the comparisons with the tests used. The "creativity" differences and the "problem-solving" differences are presented in separate columns. The students took two creativity tests and two problem-solving tests, and each test was scored for "number of ideas" and "points earned." Hence, with four tests and two scores on each test, there were a total of eight potential instances in which a significant difference might have occurred in each group (viz., the RA group) or sub-group (viz., Pair 6 in the RA group). References to Tables 21 and 38 will show that relatively few of the potential instances showed significant differences.

It will be remembered that all of the comparisons involved the two large groups of subjects, the RA and the TP group, or sub-groups within those larger groups. In the RA group, there were three pairs of 5th grade teachers and three pairs of 6th grade teachers, while in the TP group there were three pairs of 5th grade teachers. This makes a total of nine pairs of teachers and nine pairs of classes. For this reason, it will be said that a comparison within one pair of classes involves one-ninth of the sample of subjects used in the experiment. Comparisons in which the X students are compared with the C students in the total TP group would involve three pairs of classes, or approximately one-third of the total sample. Comparisons in the RA group between grade 5 subjects and grade 6 subjects involve six out of nine pairs, or two-thirds of the total sample. This type division of the sample into fractions is, of course, approximate, since it takes into account only the numbers of classes and not the numbers of students within those classes.

TABLE 39

SUMMARY OF SIGNIFICANT DIFFERENCES ON THE CREATIVITY AND PROBLEM-SOLVING TESTS, INCLUDING BOTH RA AND TP GROUPS, WITH BREAKDOWNS AS TO TYPE OF TEST, AND AS TO SUB-GROUP SHOWING SIGNIFICANT SUPERIORITY (ANALYSIS OF COVARIANCE)

	TYPE OF TEST			
	CREATIVITY TESTS		PROBLEM-SOLVING TESTS	
Superior Sub-group	Involves 1/3 of Sample	Involves 1/9 of Sample	Involves 1/3 of Sample	Involves 1/9 of Sample
IR	2	2	4	2
BR	1	4	-	2
	Involves 1/3 of sample (all of TP group)			
Boys	-		-	
Girls	2		2	
	Involves 2/3 of sample (all of RA group)			
Grade 5	3		2	
Grade 6	-		-	

For more detail, refer to Tables 21 and 38

It will be noted that there are 6 instances in which the IR groups excel over the BR groups, and in which 1/3 of the total sample are involved; in only 1 instance do the BR groups excel over the IR groups when 1/3 of the sample is involved. It is in the cases in which 1/9 of the total sample is involved that the BR groups excel over the IR groups more times than those in which the reverse is true; but the margin is smaller, 6 to 4.

In cases of girl superiority over boys, while 1/3 of the total sample is involved, there are only 4 cases out of a total of 8 possible cases. And while the cases of grade 5 superiority over grade 6 involve 2/3 of the total sample, there are 5 cases out of 8 possible cases.

Table 39 shows why no sweeping conclusions are justified on the basis of the information analyzed here.

D. Conclusions

The following conclusions appear to be supported by the evidence in this study:

1. Children in an IR program at the 5th grade level read significantly more books than children in a BR program. At the 6th grade level, the differences favor the IR students, but not by a significant amount.

2. In evaluating the results in the creativity and problem-solving tests, the most general conclusion is that there were few significant differences in comparisons of groups and subgroups. In the RA group, evidence tends to support the null hypothesis: method of reading makes few significant differences in performance on creativity and problem-solving tests. In five out of eight possible cases, 5th graders exceed 6th graders significantly, and hence grade level may make a difference in performance on Torrance and Covington tests. In the TP group, X students scored significantly higher than C students on five out of eight cases, and hence there may be reason to doubt the null hypothesis: the IR program *may*, in fact, contribute to success on these particular creativity and problem-solving tests.

3. Some differences appear in comparisons between boys and girls. Fifth grade girls in both the RA and the TP group read significantly more books than boys, but the 6th grade RA girls did not read significantly more than the 6th grade RA boys. On the creativity and problem-solving tests, no significant differences occurred in the RA group. However, in the TP group, girls exceeded boys by significant amounts in four out of the eight cases. On the creativity and problem-solving tests, there may be reason to doubt the null hypothesis: it *may* be true that girls score significantly higher on these particular tests.

E. Suggestions for Future Research

In a practical sense, the educational experience is a continuum, no part of which may be treated in a wholly meaningful manner in isolation from the rest. There are two very important consequences of this fact. First, it is difficult to make a study of one subject or one period of the school day without acknowledging the potential effect of the other parts of the school day on the criterion used.

Second, every effort must be made to develop effective means of studying learning in action. Teaching and learning are "live" and dynamic activities, not to be understood, in a true sense, by arm chair diagnosticians. It seems important that research come to grips with the dynamic nature of learning, and find more sophisticated means of recording and evaluating happenings in a classroom setting. (Heath, ed., 1964, p. 70; Bennis, et al, 1962, pp. 201-207 & 238-244; Howsam, 1960, pp. 11-19; Gage, 1963, pp. 448-501)

More refined results, and specifically more certain measurement of the effects of treatment, can only come with more complete controls. The "double-blind" system of assigning subjects to experimental groups should be used. For example, a placebo group could have been used in the present experiment: a group which, to all appearances, received the same treatment as the X group, but which in actuality had only pre- and post-testing, plus the introduction of a potential Hawthorne effect by letting teachers and students believe they were participating as a true experimental group in a research study. The ethics of this use of human beings in experiments is debatable, and alternate procedures have been suggested. (Cook, 1962; Gage, 1963, pp. 186 & 203)

Just as a placebo group might help to reveal whether the treatment or the Hawthorne effect caused a change in student performance, so a group of teachers with several years experience with IR matched on experience with BR teachers could possibly show the relative importance of IR experience to success in IR teaching.

As has been noted, differences in the socio-economic level of the community in which children live appear to make a difference in their creativity and problem-solving test scores. Hence, future research should match teachers on the bases used here, but students should be matched according to the socio-economic level of the neighborhood in which they live. Or, some method of comparing students from different socio-economic levels should be devised. Then, more meaningful comparisons of student performances can be made.

Studies similar to this one would be improved by extension, by continuation for a longer period of time than one year. What one really wants to know is: will it make a difference in the long run? In any given case, "the long run" would need to be defined operationally. (Gage, 1963, p. 236)

Wollner found that pleasant early experiences with reading were the best single predictor of later reading enjoyment. Since "the effects of prior treatments are not usually erasable," it seems desirable to start early in the school life of the child to find out which reading experiences will imbue him with those attitudes, and facilitate his learning of those skills, believed to be central to success and to continued enthusiasm for reading. Stine, in a study of 7th and 8th graders, concluded that IR had insufficient power to overcome the continuing influence of the child's previous six or seven years' experience with BR. An important element in Aranow's study was that it measured the effects of two full years of experience with IR. (Gage, 1963, p. 176; Wollner, 1949; Stine, 1962, p. 70; Aranow, 1961)

To get an "accurate" measure of any treatment effect is difficult. In a teaching method experiment, it is important to eliminate or at least reduce the effects of extraneous factors. Matching of teachers, even though always subject to the imperfectness of human evaluation, helps. Just as important is matching of classes, which was not done in this experiment. The criteria on which they would be matched would depend on the variables under study. IQ and reading achievement would seem to be a minimal pair of criteria for comparison of two methods of teaching reading. Socio-economic level has been mentioned before.

"Browsing," an important part of the child's learning about books in IR, deserves further study. For some children, books appear to have a very intimate personal meaning, and the intensity of meaning may be related to the circumstances in which the child browses among a number of books. It would be possible, also, to develop a number of hypotheses concerning the child's adaptation to the opportunities he has to browse, or about the visual and motor activities in which the child engages, and inferences from these as to his concomitant mental activities. For example, at what age can a facility in browsing be acquired? Will experience in browsing lead to a greater variety of books read? Will there be a relationship between browsing and the number of books the child completes?

Even more central to the rationale of IR is the teacher-pupil conference. Many facets of this relationship could be studied, and, hopefully, some of them would help us to understand the values that appear to accrue to the student participant. Is it the semi-privacy of the situation that helps? Does the child respond most to the personal interest shown by the teacher? In the relationship, once firmly established, does the child find it possible to more quickly recognize and focus on his own skill needs, and to concentrate sufficiently to make progress in improving those skills? Or is there some hard-to-find value, found only in a combination of aspects of the relationship to which the child responds? (Veatch, personal letter, 1963; Gage, 1963, p. 1136)

To study, in more comprehensive fashion, "books read" by children, several features could be included in a research project. For one thing, are there changes in the child's long-term patterns of reading? Secondly, it seems important to include quality as well as quantity of books read, even though such an endeavor is fraught with difficulties. Perhaps the approach of expert consensus in establishing lists against which to compare the lists actually read by groups of students would suffice. A third, and related aspect, is bibliotherapy: does the reading of books with certain elements help the child to perceive and deal with his environment in more effective ways? (Snapper, 1958)

A number of students in this study responded to the Covington tests in inappropriate ways, especially in some responses judged to be irrelevant and some which appeared to be essentially hostile. In scoring the "X-Ray" test, it appeared that lower socio-economic subjects made more irrelevant and hostile responses that did children from other backgrounds. Further insight into the tests, improved wording on the various pages, and clues about optimal test conditions, such as test instructions on each page, might be gained by detailed study of these inappropriate responses. Part of this study might relate the number and type of such responses to other dimensions of the child's performance, and to other knowledge we have or could get about the child.

Sex, as has been noted, may or may not be a factor in the 5th and 6th grade child's reaction to creativity and problem-solving tests. Other investigators have found instances in which sex does influence behavior of the type studied here. However, it seems possible that sex by itself is not so important as sex-as-related-to-overall-maturity. (Hendrickson, 1959, pp. 51-54; Ramonda, 1960)

Another study growing out of the present one could be a longevity study to determine whether students who earn high scores on creativity and problem-solving tests at this age do in fact go on to become the men and women who display effective creative and problem-solving behavior in adulthood.

Final Statement

A study based on a doctoral dissertation may be and should be a learning experience for the person who carries it out. This was a very rewarding learning experience for its author.

The evidence at the 5th grade level supports the conclusion that children in an IR program read more than children in BR. However, the results on the creativity and problem-solving tests are equivocal. The IR students performed at least as well as the BR students in almost all cases. For both the IR teachers and students, the 1963-64 school year was their first experience with this approach to reading. The results seem to indicate that IR is at least as successful as BR in stimulating creative and problem-solving responses, insofar as the Torrance and Covington tests measure those responses. Further research is needed to explore possible relationships between methods of reading instruction and creativity and problem-solving.

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Lists of Books Read By Each Child: Instructions for Teacher

1. Keep a list of books read by each child in your class during the year (see the attached). When you run out of sheets, please use blank paper, or run more sheets of your own on the ditto. Do not list single stories read by students--see instruction #4 below.

2. Please include the following in the listing: books read during the reading period, during "free reading" or "free choice" periods, during other time after finishing assigned work, during library periods (except those set aside for research in science or social studies, etc.), and reading done at home if it is assigned or voluntary work in reading (as opposed to health or spelling, for example.) Ask the students to bring to school new books bought for them which they read, or books borrowed from a library so that these can also be listed. Please also list magazines read by children.

3. Please do not include the following on the lists: text books read at social studies period, health period, etc.; basic or supplementary texts in subjects other than reading--for ex., do not list any of the State texts on California history-geography (4th grade). But do list outside reading books which have social studies content (such as the Laura Ingalls Wilder books). Do not list comic books.

4. Please indicate the fraction of each book read rounded to the nearest one-quarter of the book.

   Example: If a book is 123 pages long, $\frac{1}{4}$ of it is 31 pages
   $\frac{1}{2}$ of it is 62 pages
   3/4 of it is 93 pages.
   So if the child reads 58 pages, count it as "$\frac{1}{2}$". If he reads 99 pages, count it as "3/4". If he reads 110 pages, count it as "1".

   Count magazines as 1/4 of a book, even if they are picture magazines such as LIFE.

5. How and where should the book lists be kept? All lists should be kept at the teacher's desk. Entries on the lists should be made by the teacher, or under her direct supervision.

   I suggest you use a manila folder and keep the lists in it in alphabetical order by student.

   To the extent that children can be careful and absolutely dependable, they may be allowed to add the names of books they read to their own list. If the teacher allows students to do this, she should supervise to see it is done correctly--especially the fraction of the book completed. PLEASE give this your careful attention.

David Thatcher

READING STUDY, 1963-64

BOOKS READ

Student________________________________ Boy Girl
First name Last name (circle one)

School____________________ Teacher__________________ Grade______

Author	Title	Amount Read (rounded to nearest ½)

APPENDIX 2

MEANS FOR STANDARDIZED ACHIEVEMENT TESTS
FALL 1963

Instrument: California Achievement Test, Elementary, 1957 edition

Teacher	N	Total Reading (grade equivalent)
X-1	31	7.5
C-1	28	7.0
X-2	14	7.5
C-2	30	6.5
C-3		unavailable
X-4	12	8.5
C-4	28	6.2
C-6	26	7.0

Instrument: Stanford Achievement Test, 1958 edition

Teacher	N	Average Reading Age
C-5	23	11.45
X-5	26	10.45
X-6	25	10.30
X-3		unavailable

Instrument: Iowa Test of Basic Skills, 1960 edition

Teacher	N	Vocab. (both stated in grade equivalents)	Comprehension
TP X-7	31	6.53	6.48
TP C-7	30	5.48	5.70
TP X-8	27	5.82	5.97
TP C-8	25	4.35	4.32
TP X-9	31	7.55	7.51
TP C-9	28	6.11	6.66

APPENDIX 3

Observation of Classroom Activities
Reading Study 1963-64
David Thatcher

Visit C-2, 3 Date 2/19/64 Follow-up needed ________

Grade 5 Day of Wk: Wednesday Follow-up done ________

time: 9:30-10:10

Part A: TEACHER BEHAVIOR

Notes re behavior **Behavior**

[✓ 1. Works with a group:]
  - [✓ a) motivation]
  - [✓ b) skill-building]
  - c) a reporting activity on books read

2. Conference with 2 or 3 children

[✓ 3. Individual conference -- Individual help for one boy (slow reader)]

4. Assists individual in book selection

5. Listens to report made by individual or group to group or to whole class; assists in evaluation

6. Writes up her records:
  - a) books read
  - b) skills and other needs

Comment: Three reading groups. Teacher working with one at circle - oral reading, discussion, explanation - six in this group; pleasant atmosphere; stress on skill. Other groups at seats, all working: on reading and other subjects; considerable use of dictionary and encyclopedia, assignments for each group on board stress silent reading, word study, vocabulary building (colloquial expressions), and workbook. Each group has written assignment from book or workbooks.

Visit C-2, 3

Part B: PUPIL BEHAVIOR

✓ 1. book selection

✓ 2. silent individual reading: of basal reader, or own selection

✓ 3. oral reading in the reading group

4. sharing book or idea informally with friend or neighbor

5. formally reporting to group or to whole class

✓ 6. writing down information about a book for own record or teacher record of books read

7. works on vocabulary list

✓ 8. uses dictionary, encyclopedia, or other reference book

9. works with group on:
   - ✓ a) motivatinal activity
   - ✓ b) skill-building activity

10. works with committee to prepare report, skit, mural, etc. re reading

11. individual work to prepare report: pantomine, oral report, picture

✓ 12. writes seat-work, workbook, or the like

13. confers with teacher:
   - a) answer questions
   - b) read aloud
   - c) discuss reading
   - d) go over skill practice activity with teacher
   - e) did teacher or child initiate conference ?

✓ 14. works on some other material: science, social studies -- spelling, arithmetic

15. not working on school work:
   - a) passive (day dreaming ...)
   - b) active (wandering ...)

Comment: Very rich environment in room. Intersting chatts and instruments on weather. Maps, dioramas, some plant experiments. Children show considerable ability to work independently, to finish one assignment and move on to another. They move around room but quietly and purposefully.

Observation of Classroom Activities
Reading Study, 1963-64
David Thatcher

Visit C-3, 2 **Date** 12/5/63 **Follow-up needed** ______

Grade 5 **Day of Wk:** Thursday **Follow-up done** ______
time: 10:20-10:35

Part A: TEACHER BEHAVIOR

Notes re behavior **Behavior**

✓ 1. **Works with a group: whole class**
  - ✓ a) **motivation**
  - ✓ b) **skill-building**
  - c) **a reporting activity on books read**

2. **Conference with 2 or 3 children**

3. **Individual conference**

4. **Assists individual in book selection**

5. **Listens to report made by individual or group to group or to whole class; assists in evaluation**

6. **Writes up her records:**
  - a) **books read**
  - b) **skills and other needs**

Comment: Teacher is leading class in correction and brief discussion of workbook page - scrambled words. Children raise hands, answer. Good pace. Children show interest and enthusiasm.

Visit C-3, 2

Part B: PUPIL BEHAVIOR:

answering questions orally: workbook and introduction of new story

1. book selection

✓ 2. silent individual reading: of basal reader or own selection

3. oral reading in the reading group
4. sharing book or idea informally with friend or neighbor
5. formally reporting to group or to whole class
6. writing down information about a book for own record or teacher record of books read
7. works on vocabulary list
8. uses dictionary, encyclopedia, or other reference book

✓ 9. works with group on:
   - a) motivational activity
   - b) skill-building activity

10. works with committee to prepare report, skit, mural, etc. on reading
11. individual work to prepare report: pantomine, oral report, picture
12. writes seat-work, workbook, or the like
13. confers with teacher:
    - a) answer questions
    - b) read aloud
    - c) discuss reading
    - d) go over skill practice activity with teacher
    - e) did teacher or child initiate conference?
14. works on some other material: science, social studies
15. not working on school work
    - a) passive (day dreaming ...)
    - b) active (wandering ...)

Comment: Children are in Finding the Way and use its workbook. Teacher works with children in motivation and introduction of new vocabulary for story "Wild Honey." Wide participation.

Observation of Classroom Activities
Reading Study, 1963-64
David Thatcher

Visit C-4, 3
Date 2/5/64
Follow-up needed ________
Grade 6
Day of Wk: Wed.
Follow-up done ________
Part A: TEACHER BEHAVIOR
time: 9:30-9:50
10:10-10:25

Notes re behavior **Behavior**

✓ 1. Works with a group: whole class
   a) motivation
   b) skill-building
   c) a reporting activity on books read

2. Conference with 2 or 3 children

3. Individual conference

✓ 4. Assists individual in book selection

5. Listens to report made by individual or group to group or to whole class; assists in evaluation

6. Writes up her records:
   a) books read
   b) skills and other needs

Comment: Children preparing to go to library for library period. Teacher reminds of procedure. I observe class before going, in library, and afterward in classroom. Children go a row at a time. Now, class has 4 groups: 1 group of 3 on Durrell triangle system; two groups with workbooks (including the very low); one in Bright Peaks. Teacher reviews Dewey-Decimal system with children: putting books back out of order - very down-to-earth, shows use of card catalogue and its drawers. Student teacher is not here.

Visit C-4,3

Part B: PUPIL BEHAVIOR

✓ 1. Book selection

✓ 2. Silent individual reading: of basal reader, or own selection

✓ 3. Oral reading in the reading group

✓ 4. Sharing book or idea informally with friend or neighbor

5. Formally reporting to group or to whole class

✓ 6. Writing down information about a book for own record or teacher record of books read

7. Works on vocabulary list

8. Uses dictionary, encyclopedia, or other reference book

✓ 9. Works with group on:
    a) motivational activity
    b) skill-building activity

10. Works with committee to prepare report, skit, mural, etc. re reading

11. Individual work to prepare report: pantomine, oral reports, picture

✓ 12. Writes seat-work, workbook, or the like

13. Confers with teacher:
    a) answer questions
    b) read aloud
    c) discuss reading
    d) go over skill practice activity with teacher
    e) did teacher or child initiate conference?

14. Works on some other material: science, social studies

15. Not working on school work:
    a) passive (day dreaming...)
    b) active (wandering ...)

Comment: In library, children move around, pick books, browse, share with friends, do some reading, some work at checking out books. Back in room, 10:10, children in seats. Two in triangle group read to each other. Each of other groups has assignment - read, write questions, do workbook - written on board. Teacher works with Wings to Adventure group - introduction of story, oral reading and discussion. Teacher: close eyes, imagine selves in a cool mountain area, with feet in mountain stream....

Observation of Classroom Activities
Reading Study, 1963-64
David Thatcher

Visit X-3, 1 Date 10/14/63 Follow-up needed________

Grade 5 Day of Wk:______ Follow-up done____________
time________

Part A: TEACHER BEHAVIOR (Class Out)

Notes re behavior	Behavior
	1. Works with a group:
	a) motivation
	b) skill-building
	c) a reporting activity on books read
	2. Conference with 2 or 3 children
	3. Individual conference
	4. Assists individual in book selection
	5. Listens to report made by individual or group to group or to whole class; assists in evaluation
	6. Writes up her records:
	a) books read
	b) skills and other needs

Comment: 1 or 2 low ability children are reading older readers--such as Our Happy Ways--succeeding. One child struggled with book for 2-3 days, then admitted it was too hard. She admits: she was afraid she wouldn't like IR, afraid kids wouldn't accept--now she likes. Has read NYC guide twice. She gave Anthony (a non-reader, non-liker) a sermon in private--now he reads. Tie-in with Language: story-telling, capitalization, listening, complete sentences. One child wrote poem as outcome of story he read.

Observation of Classroom Activities
Reading Study, 1963-64
David Thatcher

Visit X-3, 5 | Date 3/20/64 | Follow-up needed ________

Grade 5 | Day of Wk: Friday | Follow-up done ________

time: 9:25-9:35

Part A: TEACHER BEHAVIOR

Notes re behavior | Behavior

✓ 1. Works with a group: spelling test
   - a) motivation
   - b) skill-building
   - d) a reporting activity on books read

2. Conference with 2 or 3 children

✓ 3. Individual conference

4. Assists individual in book selection

5. Listens to report made by individual or group to group or to whole class; assists in evaluation

6. Writes up her records:
   - a) books read
   - b) skills and other needs

Comment: Friday before Easter vacation, so not ideal day. Children very quiet. Most are working, but 2 or 3 are not, and several others are not concentrating, they appear to be waiting for 3 p.m.

At 9:35, all do spelling test. Children very quiet, teacher says words so quietly I can hardly hear in back. In conference with boy, teacher appeared to be doing her usual thorough job - it lasted over 5 minutes while I was in room and had started before I came in. This can help by allowing child to relax in conference - no hurry.

Visit X-3, 5

Part B: PUPIL BEHAVIOR:

✓ 1. book selection

✓ 2. silent individual reading: of basal reader, or own selection

3. oral reading in the reading group

✓ 4. sharing book or idea informally with friend or neighbor

5. formally reporting to group or to whole class

6. writing down information about a book for own record or teacher record of books read

7. works on vocabulary list

✓ 8. uses dictionary, encyclopedia, or other reference book

✓ 9. works with group on:
   - a) motivational activity
   - b) skill-building activity (sp.)

10. works with committee to prepare report, skit, mural, etc. re reading

11. individual work to prepare report: pantomine, oral report, picture

12. writes seat-work, workbook, or the like

✓ 13. confers with teacher:
   - ✓ a) answer questions
   - ✓ b) read aloud
   - c) discuss reading
   - d) go over skill practice activity with teacher
   - e) did teacher or child initiate conference?

✓ 14. works on some other material: science, social studies -- several on arithmetic

✓ 15. not working on school work:
   - ✓ a) passive (day dreaming ...)
   - b) active (wandering ...)

Comment:

Observation of Classroom Activities
Reading Study 1963-64
David Thatcher

Visit X-4,5 Date 3/20/64 Follow-up needed________

Grade 5-6 Day of Wk: Friday Follow-up done________

time: 11:35-12:00

Part A: TEACHER BEHAVIOR

Notes re behavior Behavior

✓ 1. Works with a group:
   a) motivation
   ✓ b) skill-building
   c) a reporting activity on books read
2. Conference with 2 or 3 children
✓ 3. Individual conference
4. Assists individual in book selection
5. Listens to report made by individual or group to group or to whole class; assists in evaluation
6. Writes up her records:
   a) books read
   b) skills and other needs

Comment: Friday before Easter vacation, so .... children are busy working as individuals and two's and three's. There is noise and movement, but purposive. Teacher talks with children: work to be done, requests them to work quietly. He puts vocabulary words on board - a multiple choice test. Teacher dictates part of multiple choice test for 6th grade - items are pretty obvious, probably far too easy for them. Repeats each item - also appears unnecessary. At least two of items on board are questionable. 6th grade read for rest of period, but most just talk. Teacher has a number of individual conferences - very brief. Teacher leaves room briefly.

Visit X-4, 5

Part B: PUPIL BEHAVIOR:

1. book selection

✓ 2. silent individual reading: of basal reader, or own selection

3. oral reading in the reading group

✓ 4. sharing book or idea informally with friend or neighbor -- much of this sharing

5. formally reporting to group or to whole class

✓ 6. writing down information about a book for own record or teacher record of books read

7. works on vocabulary list

8. uses dictionary, encyclopedia, or other reference book

9. works with group on:
    a) motivational activity
    b) skill-building activity

10. works with committee to prepare report, skit, mural, etc. re reading

11. individual work to prepare report: pantomine, oral report, picture

✓ 12. writes seat-work, workbook, or the like

13. confers with teacher:
    a) answer questions
    b) read aloud
    c) discuss reading
    d) go over skill practice activity with teacher
    e) did teacher or child initiate conference?

14. works on some other material: science, social studies

15. not working on school work:
    a) passive (day dreaming ...)
    b) active (wandering ...)

Comment: Several students doing art - coloring pictures of ship in San Francisco Bay, one free drawing, one construction paper, one girl is being "made up" in back for some scene. Very positive, friendly atmosphere.

Observation of Classroom Activities
Reading Study, 1963-64
David Thatcher

Visit X-5, 5

Date 3/20/64

Follow-up needed____

Grade 6

Day of Wk: Friday

Follow-up done____

time: 10:45-

Part A: TEACHER BEHAVIOR

Notes re behavior

Behavior

✓ 1. Works with a group:
    a) motivation
    ✓ b) skill-building
    ✓ d) a reporting activity on books read
2. Conference with 2 or 3 children
3. Individual conference
4. Assists individual in book selection
5. Listens to report made by individual or group to group or to whole class; assists in evaluation
6. Writes up her records:
    a) books read
    b) skills and other needs

Comment: Friday before Easter vacation... One group doing Wings to Adventure, some in individual books, two boys in art/construction activity. Teacher asks questions, children respond pretty well. Story involves dairy farm, and children seem to have pretty considerable understanding of farm and farm procedures - hay, etc. Traffic boys go out quietly. Finish discussion, turn to written work: summary of story.

Visit X-5, 5

Part B: PUPIL BEHAVIOR:

1. book selection

✓ 2. silent individual reading: of basal reader or own selection

3. oral reading in the reading group

4. sharing book or idea informally with friend or neighbor

5. formally reporting to group or to whole class

✓ 6. writing down information about a book for own record or teacher record of books read

7. works on vocabulary list

8. uses dictionary, encyclopedia, or other reference book

✓ 9. works with group on:
   - a) motivational activity
   - ✓ b) skill-building activity -- Discussion, answering questions re story in Wings to Adventure

10. works with committee to prepare report, skit, mural, etc. re reading

✓ 11. individual work to prepare report: pantomine, oral report, picture ··· summary

12. writes seat-work, workbook, or the like

13. confers with teacher:
   - a) answer questions
   - b) read aloud
   - c) discuss reading
   - d) go over skill practice activity with teacher
   - e) did teacher or child initiate conference?

14. works on some other material: science, social studies

15. not working on school work:
   - a) passive (day dreaming ...)
   - b) active (wandering ...)

Comment: 25 children present

Observation of Classroom Activities
Reading Study, 1963-64
David Thatcher

Visit X-6, 1 Date 10/14/63 Follow-up needed ✓
Grade 6 Day of Wk: Monday Follow-up done ✓
time: 9:25-9:40

Part A: TEACHER BEHAVIOR

Notes re behavior Behavior

1. Works with a group:
    a) motivation
    b) skill-building
    d) a reporting activity on books read
2. Conference with 2 or 3 children
3. ✓ Individual conference Teacher initiates oral reading, stresses composition
4. Assists individual in book selection
5. Listens to report made by individual or group to group or to whole class; assists in evaluation
6. ✓ Writes up her records:
    a) books read
    b) skills and other needs - words missed

Comment: Police picked up a man taking a nude sunbath across street from the school. Children have calmed down by this time. Teacher apparently reads to children every day. In discussion, teacher encourages children to read ones they can, she to read others.

Teacher says two who almost never read before now reading.

Visit X-6, 1

Part B: PUPIL BEHAVIOR:

✓ 1. book selection

✓ 2. silent individual reading: of basal reader, or own selection

3. oral reading in the reading group

4. sharing book or idea informally with friend or neighbor

✓ 5. formally reporting to group or to whole class -- One girls reads report : Dr. Doolittle -- children applaud; but no comment made. Several children make briefer, less formal reports.

✓ 6. writing down information about a book for own record or teacher record of books read -- A number do this

✓ 7. works on vocabulary list -- Each child has notebook for this; several use it and/or dictionary

✓ 8. uses dictionary, encyclopedia, or other reference book

9. works with group on:
    - a) motivational activity
    - b) skill-building activity

10. works with committee to prepare report, skit, mural, etc. re reading

✓ 11. individual work to prepare report: pantomine, oral report, picture

12. writes seat-work, workbook, or the like

✓ 13. confers with teacher:
    - a) answer questions
    - ✓ b) read aloud
    - c) disucss reading
    - d) go over skill practice activity with teacher
    - e) did teacher to child initiate conference ?

✓ 14. works on some other material: science, social studies

15. not working on school work:
    - a) passive (day dreaming ...)
    - b) active (wandering ...)

Comment:

Observation of Classroom Activities
Reading Study, 1963-64
David Thatcher

Visit X-6, 3

Date 1/28/64

Follow-up needed ________

Grade 6

Day of Wk: Tuesday

Follow-up done ________

time: 9:35-9:55

Part A: TEACHER BEHAVIOR

Notes re behavior	Behavior
	1. Works with a group:
	a) motivation
	b) skill-building
	d) a reporting activity on books read
	2. Conference with 2 or 3 children
✓	3. Individual conference
	4. Assists individual in book selection
	5. Listens to report made by individual or group to group or to whole class; assists in evaluation
✓	6. Writes up her records:
	a) books read
✓	b) skills and other needs

Comment: Teacher works with one boy, she questions, he answers, somewhat hesitantly, she shows him initial consonants on board, he discusses book, as soon as possible he "escapes" back to desk. Turns in ditto slip. Looks through and reads social studies book - the Fideler book on Canada - doesn't really read much.

A girl tells teacher about Charlotte's Web, shows interest and animation, considerable fluency. Children who want conferences put names on board after finishing book and looking up all unknown words.

Visit X-6, 3

Part B: PUPIL BEHAVIOR:

✓ 1. book selection
✓ 2. silent individual reading: of several basal reader, or own selection
3. oral reading in the reading group
✓ 4. sharing book or idea informally with friend or neighbor -- several cases, books are passed from one to another
5. formally reporting to group or to whole class
✓ 6. writing down information about a book for own record or teacher record of books read
7. work on vocabulary list
8. uses dictionary, encyclopedia, or other reference book -- several use dictionary, put words and definitions in notebooks
9. works with group on:
    a) motivational activity
    b) skill-building activity
10. works with committee to prepare report, skit, mural, etc. re reading
11. individual work to prepare report: pantomine, oral report, picture
12. writes seat-work, workbook, or the like
✓ 13. confers with teacher:
    ✓ a) answer questions
    ✓ b) read aloud
    ✓ c) discuss reading
    d) go over skill practice activity with teacher
    e) did teacher or child initiate conference?
14. works on some other material: science, social studies -- one does spelling, one boys draws cartoon character
15. not working on school work:
    a) passive (day dreaming ...)
    b) active (wandering ...)

Comment: Attention span of many of these children is short. But though distracted, they return to reading. I distract them by coming in, for example.

I really wonder if we are not "too late" or almost too late to retrieve some of these kids. In so many cases, a child is a wary creature and many of these have had tough experiences.

Observation of Classroom Activities
Reading Study, 1963-64
David Thatcher

Visit C-6,2 Date 11/21/63 Follow-up needed ✓

Grade 6 Day of Wk: Thursday Follow-up done ✓

time: 9:30-9:50

Part A: TEACHER BEHAVIOR

Notes re behavior Behavior

1. Works with a group:
   - a) motivation
   - b) skill-building
   - c) a reporting activity on books read
2. Conference with 2 or 3 children
3. ✓ Individual conference - on written work
4. Assists individual in book selection
5. Listens to report made by individual or group to group or to whole class; assists in evaluation
6. Writes up her records:
   - a) books read
   - b) skills and other needs

Comment: Children reading Across Blue Bridge and Wings to Adventure. A number writing and illustrating reports (news type) of stories read (?). Two girls work together. One boy reads paperback. Children seem attentive, pretty good attention span. At 2 minutes before bell, teacher asks everyone to clean up, turn in, or finish at home for tomorrow.

Visit C-6,2

Part B: PUPIL BEHAVIOR:

1. book selection
✓2. silent individual reading: of basal reader, or own selection
3. oral reading in the reading group
✓4. sharing book or idea informally with friend or neighbor – not much
5. formally reporting to group or to whole class
6. writing down information about a book for own record or teacher record of books read
7. works on vocabulary list
✓8. uses dictionary, encyclopedia, or other reference book
9. works with group on:
    a) motivational activity
    b) skill-building activity
10 works with committee to prepare report, skit, mural, etc re reading
✓11. individual work to prepare report: pantomine, oral report, picture news story
12. writes seat-work, workbook, or the like
✓13. Confers with teacher:
    a) answer questions
    ✓b) read aloud
    c) discuss reading
    d) go over skill practice activity with teacher
    ✓e) did teacher or child initiate conference?

    Evaluate written work
14. works on some other material: science, social studies
✓15. not working on school work:
    ✓a) passive (day dreaming ...) -- Boy next to where I sit is easily distracted, partly by me.
    b) active (wandering ...)

Comment: Teacher uses time to help individuals, most with written work; one checked on oral reading. Teacher very task-oriented. Circulates, observes what children doing, helps, answers questions. Very nice manner toward children.

APPENDIX 4 - SAMPLE NEWSLETTER

NEWSLETTER ...... from David A. Thatcher ...... Nov. 1963

When you receive this letter, I will have visited all teachers in the reading study at least once. I wish it was possible to share with you all of the interesting experiences I have seen in the classrooms. It is heartening to see so many students having such positive and enjoyable learning experiences in reading. After all, our goal--yours and mine--is to improve the success and the enjoyment children have with reading. I am very pleased with what I have seen.

Libraries in Classrooms

In both individualized reading and basal reader classrooms, teacher have been doing a wonderful job of accumulating books in their rooms. Excellent cooperation of administrators and district personnel has been a real help here.

Mrs. ________'s 5th grade in Cupertino has 233 books in the classroom as of 10/31/63. The class has made it a project to bring in books to add to the library. A child who brings in a book puts his name in the front. He may take the book home if he wishes. But so far, most of the books have been marching in to join up "for the duration."

Good progress has been made in other classes. Teachers have spoken to parents at open house, and PTA's have been invited to help in book drives. Many classes are using Arrow Book Club to add to their supply.

Remember, our aim is to have as many books as possible right in your classroom. There should be at least 100 different titles in each room. This applies to both basal reader classes and individualized reading classes. Consult your principal if you need help. If you need additional help, ask me.

Miss ___________ in Irvington has a very good system for getting as much mileage as possible out of each book. She and other Irvington teachers have several reading classes a day coming to them, so they have a special problem. She uses yarn and small squares of tagboard (about 1-1/2"). A hole is punched in one corner of the square and a 6" piece of yarn is tied securely to the square to make a bookmark. Then, any child who starts the book puts his name on a clean bookmark, and marks his place at the end of the reading period. This means the book stays in the room so others can have access to it. While this system is especially useful in Irvington, it may help teachers elsewhere by making it possible for several children to use a popular book at different times of the school day.

Please make a count of the number of separate titles (including basal and supplementary readers and all "library" books) in your classroom as of Tues., November 12. You should count books the children have in their desks, and any they have taken home on loan. Please write the number on the attached postcard and mail to me during the week of November 12.

Be sure to see *Murray McCain's* little book called "Books," published by Simon & Schuster. Many people of many ages (including you) will enjoy it! It might be fun to read aloud to your class.

A boy at Highland School in Oakland has had an interesting history. Because of emotional upset, he usually attended school for only an hour or an hour and a half per day. He was a virtual non-reader. This year, under the guidance of 6th grade teacher ______________, the boy has made great progress. He now spends the regular day at school, and he now reads and takes great pride in his reading.

Important Note for All Teachers:

If you are teaching basal reading, please teach by the basal reader method, following the suggestions contained in the teacher's manual of the reader. If you are teaching individualized reading, follow the features of the program: individual self-selection of books, and instruction through individual conferences and through groups of children grouped according to temporary skill needs. In the last few days, I have received letters from Jeannette Veatch at Penn State and Lyman Hunt at University of Akron, both reminding me how important it is for teachers to teach according to the prescribed method; then, if the test gains by one group exceed those of the other by a significant amount, it can reasonably be attributed to the method (since teachers are matched according to experience and rated competence).

In case you have questions about either method, please ask me --by letter or phone.

From time to time, I will take photos of activities, libraries, posters, etc., in the classrooms in the study. I'll bring them with me when I visit, and will be glad to show them to you.

Do you want to hold in-service meetings? I'll be glad to arrange them at your request. They can be on any topic of interest to you, and I will try to get a speaker if you wish.

Remember, we still have a "mobile library" of materials on reading (especially individualized reading). I will add materials to the library if you request them. Any time you see me, you may borrow or return a book. Also, remember your district or school professional library is sure to have many valuable materials.

Miss ________, 6th grade teacher in Niles, uses a simple but effective means of keeping track of individual problems students are having. She has a 3x5 card for each student, and writes "problem area" and date the problem was noted.

-3-

(This sheet sent to all BR teachers)

To all teachers using basal reader method:

A "cluster" system for practising oral reading, for conducting discussion of a story, for working on comprehension and interpretation skills, and for developing individual and group abilities to evaluate these three activities is used in the Castro Valley School District. It works like this:

1. The teacher divides the children in a particular reading group into clusters of three, giving due consideration to the compatibility of each threesome.

2. When the teacher feels it is desirable, she will direct the clusters to meet--generally, when they have finished silent reading of a particular story, and have had the word-attack skill lesson on it.

3. Each cluster will meet, each child taking turns at oral reading. Often, they will not read the entire story. When the oral reading has been completed, they will criticize each other's oral reading. Following this, they will take turns asking each other questions as to the content, sequence of events, characterization and the like. Finally, the children will evaluate each other's questions and answers.

4. From time to time, the teacher will listen in on the reading, questioning, and evaluation of each cluster. She will assist in building individual and group standards. Occasionally, she will change a child from one cluster to another.

Children in Mrs. _______'s class at Vannoy School in Castro Valley enjoy this system. Mrs. _______ reports that they are improving in the skills practised. Mrs. ______ uses a similar system with children in pairs rather than threes.

Donald D. Durrell has been one of the reading authorities who has supported this cluster plan. An article in which he advocated it was his contribution to the IRA Conference in 1957. Reference: Nancy Larrick (ed.), Reading in Action, Conference Proceedings of the IRA, vol. 2, 1957; pub. by Scholastic Magazines, N.Y. This book is likely to be found in your professional library.

You may phone me, collect, at any time you have a problem concerning reading. Please call between 6 & 10 PM on any evening except Wednesday. My phone is AL 2-2905.

I send you best wishes for continued success in teaching reading. Your cooperation in this study is greatly appreciated.

David Thatcher

(This sheet sent to all IR teachers)

To all IR teachers:

A. Jeannette Veatch says in her letter to me:

> "I would urge that you ask your individualized reading teachers to teach WORD ANALYSIS Skills during written language and spelling time. Then the carry-over into reading is in the form of WORD PERCEPTION. This is the mistake all reading authorities make. Word analysis is a spelling skill. Word perception is a reading skill. .... Then the individual conference can be devoted to the true reading skills of critical analysis of ideas .... the whole raison d'etre of reading, anyway ...."

B. Which brings up: What do you do in your individual conferences? Jeannete Veatch has sent me a mimeographed guide to an individual conference, and I share parts of it with you:

You, the teacher, want to find out four things in each individual conference:

"1. How well has the pupil read his chosen material silently?

2. How well does the pupil gauge the obvious and hidden meanings in his chosen material? ...

3. Does the pupil have some insight into his own personal identification with his chosen material? ...

4. How well can the pupil read orally? "

To prepare for the conference, the student should be able to answer these questions adequately:

"1. Have I chosen the part of the book that I prefer? (to share with the teacher)

2. Will I be able to tell all of the story? (but only report on part of it)

3. Have I practiced reading this chosen part aloud so that I am truly ready to read by best?

4. Am I sure I understand all about the book I have chosen?"

This will give you a starter. Does it interest you? Will it help? If so, let me know I'll send more!

Call me collect at any time you have a problem concerning reading. Please call between 6 and 10 PM on any evening except Wednesday. Phone: AL 2-2905.

I send you best wishes for continued success in teaching reading. Your cooperation in this study is greatly appreciated.

David Thatcher

APPENDIX 5

Reading Experiment
1963-1964

WAYS OF GETTING BOOKS, AND WAYS OF MAXIMIZING USE OF BOOKS:

1. Ways of getting books
   - a. classroom collection
   - b. school library
   - d. district library
   - d. public library: thru class visits, teacher visits, or individual student visits
   - e. children bring own books from home
   - f. teacher's books
   - g. books contributed by parents, or by PTA or Parents' Club
   - h. Arrow Book Club: ask students to contribute books to class library after reading them
   - i. second hand books: Salvation Army, rummage sales, book stores that specialize in second hand
   - j. bookmobile
   - k. your ideas

2. Ways of maximizing use of available books:
   - a. ask for suggestions from the principal
   - b. ask for suggestion from the librarian, district librarian
   - c. keep watch on books and their usage. Be ready to trade slower-moving books, or to stimulate their use
   - d. don't allow a child to hoard books
   - e. trade books between classrooms. Though books may come from several sources, as long as they are properly marked, and lists are kept before trading, books can be traded--not only on the same grade level, but with teachers on the grade above and the grade below yours.
   - f. trade with the school library, district library, or the bookmobile or public library.
   - g. your ideas

Calendar for Reading Experiment
1963-1964

Sept. 16	Experiment begins. Teachers should teach either basal or individualized reading from Sept. 16 until the end of May. Begin keeping lists of books read by each student on Sept. 16.
Weeks of Sept. 23 & Sept. 30	Testing to be done during this period: 1. Torrance tests (thinking of new ideas) 2. Problem-solving tests Hold completed materials until David Thatcher picks them up.
Sept.	David Thatcher will begin visiting classes; hopes to visit each class about once a month.
Weeks of May 24 & May 31:	Testing to be done during this period: Same as above Hold completed materials until David Thatcher picks them up, or until other arrangements are made.
June 4, 1964	End of experiment. On June 4, make the final entries on the lists of books read or partially read by each child. Hold lists until picked up.

APPENDIX 6

Questionnaire for Teachers (to compare individualized reading with basal reading

1. How do you know that a child has really read the story or book?

2. How and when do you check on vocabulary?

3. How do you ascertain that the children are really using word-recognition techniques and are not just developing careless habits of silent reading?

4. What do you do when children list words they do not know and then do nothing about them?

5. How do you check whether the child understands what he is reading?

6. How and when do you check on such "skills" as noting details, unerstanding relationships, etc.?

Questionnaire for teachers - p. 2

7. What do you do about the child who reads so fast and finishes books so quickly that you cannot check each book he reads? Do you think it is important to check every book a child reads? Why? Why not?

8. How do you measure the child's progress in Individualized Reading? How often? What evaluative measures do you use?

9. What are your special problems with respect to measuring progress in Individualized Reading?

10. Any further comments you would like to make re: evaluation of Individualized Reading?

-continued-

PART II

This part of the Evaluation Questionnaire was designed to be answered in the light of this major question, "Which reading program -- individualized reading or the basal reader approach -- affords maximum opportunity for the teacher to develop the reading essentials listed below?" If you feel that individualized reading affords the greater opportunity, place a check in the column marked I.R. If you feel that the basal reader approach affords the greater opportunity, place a check in the column marked B.R. We are also interested in your reasons for checking I.R. or B.R. Could you indicate briefly in the column marked Comments your major reasons for your choices.

A. HOW WELL DOES THE CHILD READ?

1. Regardless of approach, all children must be able to see and hear words clearly and recognize their meanings. This is commonly called Word Recognition. Which reading program affords maximum opportunity for the chi child to:

	IR	BR	Comments
1.1 Develop curiosity about and interest in words?	___	___	
1.2 Acquire a wide sight vocabulary?	___	___	
1.3 Develop feelings and understanding of semantic meanings of words?	___	___	
1.4 Attack words independently through the use of word-recognition techniques?	___	___	

Questionnaire for teachers - p.4

2. Regardless of approach, all children must be able to understand sentences, paragraphs, pages, and stories. This is commonly called Meaning Skills or Skills of Comprehension. Which reading program affords maximum opportunity for the child to:

	IR	BR	Comments
2.1 Understand what he is reading?	___	___	
2.2 Initiate some of his own thinking about the things he is reading?	___	___	
2.3 Select the main ideas and supporting details?	___	___	
2.4 Appraise critically the materials he reads?	___	___	
2.5 Read with understanding of the author's purpose?	___	___	
2.6 Distinguish between fact and fiction?	___	___	

-continued-

	IR	BR	Comments
2.7 Select and evaluate materials in terms of specific problems?	___	___	
2.8 Contribute ideas from reading toward the solution of problems?	___	___	
2.9 Become independent in applying varied rates of reading to the materials in terms of his own purposes?	___	___	

-continued-

3. **Regardless of approach, all children must be able to "get at" the information they need and seek. This essential is commonly called Work-Study Skills. Which reading program affords maximum opportunity for the child to:**

	IR	BR	Comments
3.1 Use reference materials to locate information with increasing independence?	___	___	
3.2 Develop useful library skills such as using pictures, index, chapter headings, footnote, glossaries, table of contents, etc.?	___	___	
3.3 Acquire the techniques necessary for taking notes, organizing content, using notes, writing reports, writing summaries, etc.?	___	___	
3.4 Choose pertinent references for the information he seeks?	___	___	

4. **Regardless of approach, all children must be able to read aloud effectively. This essential is commonly called good Oral Reading. Which program affords maximum opportunity for the child to:**

	IR	BR	Comments
4.1 Read before an audience and keep them interested?	___	___	
4.2 Choose with good purposes his material for oral reading?	___	___	

B. WHAT IS THE CHILD READING?

Which reading program affords maximum opportunity for the child to:

	IR	BR	Comments
1. Utilize a wide variety of materials to satisfy his purposes?	___	___	
2. Read good literature (both old and new) commensurate with his age and interests?	___	___	

	IR	BR	Comments
3. Read different kinds of content according to his needs, abilities, and interests, such as folk lore, poetry, fairy tales, humor, fantasy, biography, science, animal tales, etc.	___	___	
4. Select reading materials which point toward an awareness of "good taste" in reading?	___	___	
5. Satisfy his curiosity or to solve problems by refering to printed materials?	___	___	
6. Develop a love for reading?	___	___	
7. Turn to books in his leisure time and attempt to read them independently?	___	___	
8. Refer to ideas, facts or stories previously read and use them to solve current problems?	___	___	

C. HOW DOES THE CHILD REACT TO HIS READING?

	IR	BR	Comments
1. Feel sure that his choices are truly being accepted?	___	___	
2. Feel free to go to the teacher when he needs help for skills, for discussion, for interpretation?	___	___	
3. Assume or accept a reasonable amount of responsibility in his own learning?	___	___	
4. Accept responsibility for planning some of his reading experiences for a day, longer?	___	___	
5. Recognize some of his own reading assets and liabilities?	___	___	
6. Gain independence in efficient methods of study?	___	___	
7. Share and talk over his reading experience with others?	___	___	

	IR	BR	Comments
8. Accept in positive ways the contributions of other children?	___	___	
9. React to his reading through other media as creative writing, creative dramatics, spontaneous discussions, experiments, drawings, paintings, poetry, etc?	___	___	
10. Give evidence of reacting emotionally to what he reads?	___	___	
11. Appreciate humor, pathos, suspense, and mood of story?	___	___	
12. Develop appreciation for favorite author?	___	___	
13. Recognize different styles of different authors?	___	___	
14. Identify with charscters in the books?	___	___	
15. Grow in appreciation of literary style?	___	___	

	IR	BR	Comments
16. Become curious about words?	___	___	
17. Enjoy finding new and interesting words and phrases?	___	___	
18. Be completely absorbed in what he reads?	___	___	

Source: A Practical Guide to Individualized Reading, Board of Education, City of New York, Bureau of Educational Research, Publication No. 40, Oct. 1960.

APPENDIX 7 - CHECK LIST USED IN IR
(Sample)

Individual Reading Check List

S - Satisfactory
O - Outstanding
U - Unsatisfactory

Student's Name ____________________
*See back for additional comments

	Ability Level						Specific Difficulties
VOCABULARY							
A. Recognition							
B. Meaning							
C. Rationalization							
WORD ATTACK							
A. Syllables							
B. Suffixes							
C. Prefixes							
D. Root Words							
E. Accents							
F. Phonetic Skill							
G. Vowels							
H. Dictionary							
COMPREHENSION							
A. Main Idea							
B. Details							
C. Creative Reading							
D. Oral Reading							

APPENDIX 8

TABLES

Table 4

Chi-Square for RA Group, Grade 5:
Books Read, & Method of Reading

Books Read:

Method	High Range:42-176 books	Medium Range:23-41 books	Low Range:0-22-3/4 books	Total
X	27 (14.77)	14 (15.11)	4 (15.11)	45
C	16 (28.23)	30 (28.89)	40 (28.89)	86
Total	43	44	44	131

Table 5

Chi-Square for RA Group, Grade 6:
Books Read, & Method of Reading

Books Read:

Method	High Range:21-1/4-172 bks.	Medium Range: 13-21 bks.	Low Range:0-12 bks.	Total
X	23 (19.31)	19 (19.31)	15 (18.39)	57
C	19 (22.69)	23 (22.69)	25 (21.61)	67
Total	42	42	40	124

Table 6

Chi-Square for TP Group

Books Read, & Method of Reading

Books Read:

Method	High Range:34-1/2-118 bks.	Medium Range: 18-3/4-34-1/4 bks.	Low Range:0-18-1/2 bks.	Total
X	50 (30)	38 (30)	12 (30)	90
C	7 (27)	29 (27)	45 (27)	81
Total	57	57	57	171

Table 7

Chi-square for RA Group, Grade 5
Books Read, & Reading Achievement

Reading Achievement	Books Read: High Range:42-176 books	Medium Range:23-41 books	Low Range:0-22-3/4 books	Total
High 7.9-9.5	16 (10.89)	7 (10.89)	10 (11.22)	33
Medium 6.8-7.8	11 (11.22)	12 (11.22)	11 (11.56)	34
Low 3.9-6.7	6 (10.89)	14 (10.89	13 (11.22)	33
Total	33	33	34	100

Table 8

Chi-Sqaure for TP Group, Books Read, and Reading Achievement (as measured by comprehension score on Iowa Test of Basic Skills)

Achievement	High Range: 34-1/2 - 118 books	Medium Range: 18-3/4-34-1/4 books	Low Range: 1-18-1/2 books	Total
High 67-97	23 (18.66)	17 (18.33)	16 (18.99)	56
Medium 55-67	18 (19.66)	20 (19.32)	21 (20.01)	59
Low 27-55	16 (18.66)	19 (18.33)	21 (18.99)	56
Total	57	56	58	171

Table 9.

Chi-Square for RA Group, Grade 5
Books Read and Sex

Sex	High Range:42-176 bks.	Medium Range:23-41 bks.	Low Range:0-22-3/4 bks.	Total
Boys	20 (17.73)	12 (18.14)	22 (18.14)	54
Girls	23 (25.27)	32 (25.86)	22 (25.86)	77
Total	43	44	44	131

Table 10

Chi-Square for RA Group, Grade 6
Books Read and Sex

Sex	High Range:21-1/4-172 books	Medium Range: 13-21 books	Low Range:0-12-1/4 bks.	Total
Boys	18 (16.53)	12 (17.38)	20 (16.12)	50
Girls	23 (24.46)	31 (25.66)	20 (23.87)	74
Total	41	43	40	124

Table 11

Chi-Square for TP Group
Books Read and Sex

Sex	High Range:34-1/2-118 books	Medium Range: 18-3/4-34-1/2 books	Low Range:1-18-1/2 books	Total
Boys	14 (23.40)	25 (22.19)	30 (23.40)	69
Girls	44 (34.60)	30 (32.81)	28 (34.60)	102
Total	58	55	58	171

Table 13.

Problem 1

No. Ideas, Toy Dog/Toy Truck, TP Group   Analysis of Covariance

Source of variation	d/f	S.S.	M.S.	F.
Between Pairs	2	607.26660	303.63330	5.36
Between Treatment	1	300.71338	300.71338	5.31
Between Sex	1	260.08350	260.08350	4.59
P X T	2	4.73291	2.36645	<1
P X S	2	0.47803	0.23901	<1
T X S	1	29.70166	29.70166	<1
Error	156	8,834.52832		

Table 14

Problem 2.

No. Points, Toy Dog/Toy Truck, TP Group   Analysis of Covariance

Source of variation	d/f	S.S.	M.S.	F.
Between Pairs	2	40.57398	20.28699	1.31
Between Treatment	1	92.23566	92.23566	5.97
Between Sex	1	136.18201	136.18201	8.81
P X T	2	1.92725	.96362	<1
P X S	2	16.53705	8.26852	<1
T X S	1	6.60578	6.60578	<1
Error	156	2,410.83105		

Table 15

Problem 3.

No. Ideas, Circles/Squares, TP Group — Analysis of Covariance

Source of variation	d/f	S.S.	M.S.	F.
Between pairs	2	108.02539	54.01269	2.41
Between Treatment	1	10.02783	10.02783	<1
Between Sex	1	45.60986	45.60986	2.04
P X T	2	15.05322	7.52661	<1
P X S	2	6.46045	3.23022	<1
T X S	1	36.57959	36.57957	1.64
Error	153	3,422.51123		

Table 16

Problem 4.

No. Points, Circles/Squares, TP Group — Analysis of Covariance

Source of variation	d/f	S.S.	M.S.	F.
Between Pairs	2	40.46045	20.23022	1.09
Between Treatment	1	90.09375	90.09375	4.86
Between Sex	1	16,64917	16.64917	<1
P X T	2	149.29370	74.64685	4.03
P X S	2	16.05957	8.02978	<1
T X S	1	14.76660	14.76660	<1
Error	153	2,833.49048		

Table 17

Problem 5

No. Ideas, Elevator, TP Group | Analysis of Covariance

Source of variation	d/f	S.S.	M.S.	F.
Between pairs	2	39.67944	19.83972	5.40
Between Treatment	1	41.24664	41.24664	11.22
Between Sex	1	14.34766	14.34766	3.90
P X T	2	3.07452	1.53726	<1
P X S	2	4.82294	2.41147	<1
T X S	1	.01666	.01666	<1
Error	151	555.27600		

Table 18

Problem 6.

No. Points, Elevator, TP Group | Analysis of Covariance

Source of variation	d/f	S.S.	M.S.	F.
Between Pairs	2	197.55103	98.77551	4.90
Between Treatment	1	286.35474	286.35474	14.22
Between Sex	1	64.92066	64.92066	3.22
P X T	2	58.36158	29.18079	1.45
P X S	2	31.99097	15.99548	<1
T X S	1	1.62476	1.62476	<1
Error	151	3,041.51025		

Table 19

Problem 7.

No Ideas, X-Ray, TP Group — Analysis of Covariance

Source of variation	d/f	S.S.	M.S.	F.
Between Pairs	2	21.85869	10.92934	7.94
Between Treatment	1	13.62723	13.62723	9.90
Between Sex	1	9.65162	9.65162	7.01
P X T	2	1.61893	.80946	<1
P X S	2	1.76091	.88045	1.76
T X S	1	0.32316	.32316	<1
Error	146	200.95331		

Table 20

Problem 8.

No. Points, X-Ray, TP Group — Analysis of Covariance

Source of variation	d/f	S.S.	M.S.	F.
Between Pairs	2	114.77881	57.38940	8.40
Between Treatment	1	93.10486	93.10486	13.62
Between Sex	1	10.51514	10.51514	1.54
P X T	2	.93598	.46799	<1
P X S	2	7.50013	3.75006	<1
T X S	1	2.85321	2.85321	<1
Error	146	997.90588		

Table 22

Toy Dog/Toy Truck, No. Ideas - Multiple Regression

	Mean	Zero Order Corr.	Partial Coeff.	Regr. Coeff.	t value Reg. Coeff.
X Boys, N=20					
Fall	13.55	.41	.35	.47	1.50
I.Q.	126.55	.13	.11	.08	.47
R.A.	7.35	.26	-.03	-.04	-.11
X Girls, N=23					
Fall	12.78	.06	.11	.14	.47
I.Q.	123.26	.05	.10	.07	.46
R.A.	7.27	-.08	-.12	.08	- .54
C Boys, N=19					
Fall	10.84	.55	.61	1.04	3.02
I.Q.	119.34	-.12	-.03	-.04	-.33
R.A.	7.01	-.07	.32	.21	1.30
C Girls, N=34					
Fall	9.32	.21	.28	.35	1.62
I.Q.	121.71	-.11	.25	.45	1.39
R.A.	7.29	-.19	-.28	-.56	-1.61

Table 23

Toy Dog/Toy Truck, No. Points - Multiple Regression

	Mean	Zero Order Corr.	Partial Coeff.	Regr. Coeff.	t value Reg. Coeff.
X Boys, N=20					
Fall	6.45	.36	.38	.39	1.65
I.Q.	126.55	-.06	.00	.00	.00
R.A.	7.35	.02	-.14	-.11	- .55
X Girls, N=23					
Fall	6.95	-.06	-.02	-.03	-.08
I.Q.	123.26	-.02	.02	.00	.09
R.A.	7.27	-.15	-.14	-.06	-.62
C Boys, N=19					
Fall	5.63	.12	.25	.34	1.01
I.Q.	119.34	.07	-.09	-.03	-.34
R.A.	7.01	.24	.32	.14	1.31
C Girls, N=34					
Fall	4.00	.26	.30	.35	1.70
I.Q.	121.71	-.03	.17	.15	.96
R.A.	7.28	-.07	-.17	-.16	-.93

Table 24

Circles/Squares, No. Ideas - Multiple Regression

	Mean	Zero Order Corr.	Partial Coeff.	Regr. Coeff.	t value Reg. Coeff.
X Boys, N=20					
Fall	8.85	.61	.47	.85	2.14
I.Q.	126.55	-.04	-.18	-.08	- .73
R.A.	7.35	.43	.22	.22	.94
X Girls, N=23					
Fall	10.26	.15	.15	.16	.68
I.Q.	123.26	-.21	-.22	-.07	- .98
R.A.	7.27	-.01	.03	.00	.12
C Boys, N=17					
Fall	7.53	.82	.79	.66	4.70
I.Q.	118.76	-.19	-.08	-.02	- .30
R.A.	7.03	-.37	-.10	-.03	- .36
C Girls, N=34					
Fall	6.11	.45	.41	.64	2.46
I.Q.	121.56	.32	.05	.04	.26
R.A.	7.28	.29	-.17	-.17	- .95

Table 25

Circles/Squares, No. Points - Multiple Regression

	Mean	Zero Order Corr.	Partial Coeff.	Regr. Coeff.	t value Reg. Coeff.
X Boys, N=20					
Fall	6.75	.66	.58	.87	2.88
I.Q.	126.55	-.04	-.13	-.06	- .51
R.A.	7.35	.37	.24	.24	1.02
X Girls, N-23					
Fall	6.70	.38	.44	.55	2.14
I.Q.	123.26	-.37	-.45	-.17	-2.18
R.A.	7.27	.01	.08	.03	.37
C Boys, N-17					
Fall	4.65	.60	.60	.62	2.68
I.Q.	118.76	-.18	-.17	-.06	- .63
R.A.	7.03	-.20	.06	.02	.20
C Girls, N-34					
Fall	4.09	.34	.31	.47	1.79
I.Q.	121.56	-.37	-.19	-.15	-1.07
R.A.	7.28	-.28	.01	.01	.06

Table 26

Elevator, No. Ideas - Multiple Regression

	Mean	Zero Order Corr.	Partial Coeff.	Regr. Coeff.	t value Reg. Coeff.
X Boys, N=20					
Fall	3.40	.42	.39	.55	1.70
I.Q.	126.75	.14	.07	.02	.27
R.A.	7.43	.46	.37	.16	1.61
X Girls, N=24					
Fall	4.00	.01	.04	.05	.17
I.Q.	123.08	.37	.40	.07	1.97
R.A.	7.31	-.06	-.19	-.03	- .85
C Boys, N=18					
Fall	3.50	.24	.17	.29	.63
I.Q.	119.33	.18	-.09	-.02	- .32
R.A.	6.88	.40	.32	.08	1.26
C Girls, N=33					
Fall	3.55	.23	.31	.31	1.78
I.Q.	121.06	-.16	-.24	-.08	-1.30
R.A.	7.25	-.10	.14	.05	.76

Table 27

Elevator, No. Points - Multiple Regression

	Mean	Zero Order Corr.	Partial Coeff.	Regr. Coeff.	t value Reg. Coeff.
X Boys,N=20					
Fall	7.35	.21	.14	.22	.58
I.Q.	126.75	.13	-.04	-.02	- .16
R.A.	7.43	.47	.42	.46	1.87
X Girls, N=24					
Fall	7.88	-.11	-.09	-.13	- .42
I.Q.	123.08	.30	.34	.15	1.59
R.A.	7.31	-.09	-.14	0.06	- .64
C Boys, N=18					
Fall	7.11	.10	-.06	-.09	- .22
I.Q.	119.33	.21	-.18	-.10	- .70
R.A.	6.88	.42	.39	.23	1.61
C Girls, N=33					
Fall	6.97	.20	.27	.28	1.53
I.Q.	121.06	-.10	-.16	-.12	- .87
R.A.	7.25	-.08	.07	.06	.36

Table 28
X-Ray, No. Ideas - Multiple Regression

	Mean	Zero Order Corr.	Partial Coeff.	Regr. Coeff.	t value Reg. Coeff.
X Boys, N=21					
Fall	2.14	.11	.05	.05	.22
I.Q.	126.43	.33	.26	.03	1.09
R.A.	7.40	.25	.11	.03	.45
X Girls, N=24					
Fall	2.75	.17	.17	.14	.76
I.Q.	123.08	.06	.06	.01	.29
R.A.	7.31	-.04	-.08	-.01	- .34
C Boys, N=17					
Fall	2.53	-.17	-.20	-.20	- .72
I.Q.	121.18	.23	.40	.06	1.58
R.A.	7.02	-.05	-.35	-.06	-1.35
C Girls, N=34					
Fall	2.38	.46	.41	.34	2.46
I.Q.	121.53	.16	-.13	-.03	- .74
R.A.	7.28	.26	.18	.05	1.02

Table 29
X-Ray, No. Points - Multiple Regression

	Mean	Zero Order Corr.	Partial Coeff.	Regr. Coeff.	t value Reg. Coeff.
X Boys, N=21					
Fall	3.95	.11	.06	.07	.24
I.Q.	126.43	.33	.26	.08	1.13
R.A.	7.40	.23	.08	.04	.33
X Girls, N=24					
Fall	5.33	.19	.15	.14	.70
I.Q.	123.08	.13	.07	.02	.32
R.A.	7.31	.16	.10	.02	.46
C Boys, N=17					
Fall	5.18	.20	-.02	-.03	- .09
I.Q.	121.18	.42	.59	.22	2.63
R.A.	7.02	.01	-.47	-.18	-1.92
C Girls, N=34					
Fall	4.03	.31	.24	.25	1.36
I.Q.	121.53	.13	-.17	-.09	- .96
R.A.	7.28	.26	.24	.15	1.37

Table 30

Problem 1.

No. Ideas Toy Dog/Toy Truck Analysis of Covariance

Source of Variation	d/f	S.S.	M.S.	F.
Between Grades	1	305.46875	305.46875	4.71
Within Grades	287	18,576.35548	64.72597	
P	4	334.52344	83.63086	1.62
T	2	982.41309	491.20654	9.49
S	2	325.77930	162.88965	3.15
P X T	4	2,920.03418	730.00854	14.11
P X S	4	47.75879	11.93969	<1
T X S	2	18.84668	9.42334	<1
P X T X S	4	234.43750	58.60937	1.13
Error	265	13,712.56250	51.74552	
Total	288	18,881.82423		

Table 31

Problem 2.

No. Points Toy Dog/Toy Truck Analysis of Covariance

Source of Variation	d/f	S.S.	M.S.	F.
Between Grades	1	62.51782	62.51782	2.13
Within Grades	287	7,034.47948	24.51038	
Between pairs	4	400.34741	100.08685	4.16
Between treat.	2	43.94214	21.97107	1.08
Between sex	2	114.30810	57.15405	2.82
P X T	4	902.18799	225.54699	11.11
P X S	4	78.92016	19.73004	<1
T X S	2	58.43799	29.21899	1.44
P X T X S	4	57.69726	14.42431	<1
Error	265	5,378.63843	20.29675	
Total	288	7,096.99730		

Table 32

Problem 3.

No. Ideas	Circles-Squares		Analysis of Covariance	
Source of Variation	d/f	S.S.	M.S.	F.
Between grades	1	371.45948	371.45948	6.92
Within Grades	284	7,430.63772	53.63640	
Between pairs	4	582.12110	145.53027	2.68
Between treat.	2	32.68799	16.34399	<1
Between sex	2	103.27637	51.63818	2.63
P X T	4	1,077.43067	269.35766	13.70
P X S	4	132.69825	33.17456	1.69
T X S	2	31.01123	15.50561	<1
P X T X S	4	320.50684	80.12671	4.08
Error	262	5,150.90527	19.43737	
Total	285	7,802.09756		

Table 33

Problem 4.

No. Points	Circles-Squares		Analysis of Covariance	
Source of Variation	d/f	S.S.	M.S.	F.
Between Grades	1	530.12158	530.12158	21.18
Within Grades	285	6,954.40672	24.40143	
Between pairs	4	136.03613	34.00903	1.86
Between treat.	2	12.51514	6.25757	<1
Between sex	2	53.00440	26.50220	1.45
P X T	4	1,710.90015	427.72503	23.43
P X S	4	88.49414	22.12353	1.21
T X S	2	2.22778	1.11389	<1
P X T X S	4	168.49487	42.12371	2.31
Error	262	4,782.73413	18.25471	
Total	286	7,484.52832		

Table 34

Problem 5.
No. Ideas Elevator Analysis of Covariance

Source of Variation	d/f	S.S.	M.S.	F.
Between Grades	1	119.62152	119.62152	23.28
Within Grades	280	1,438.16041	5.13629	
Between pairs	4	47.80603	11.95150	4.26
Between treat.	2	24.41345	12.20672	2.26
Between sex	2	6.90680	3.45340	2.26
P X T	4	191.02680	47.75670	11.16
P X S	4	22.45313	5.61328	1.31
T X S	2	3.49957	1.74978	<1
P X T X S	4	38.12061	9.53015	2.23
Error	258	1,103.93402	4.27881	
Total	281	1,557.78193		

Table 35

Problem 6.
No. Points Elevator Analysis of Covariance

Source of Variation	d/f	S.S.	M.S.	F.
Between Grades	1	586.16602	586.16602	27.34
Within Grades	280	8,235.25921	29.41164	
Between pairs	4	256.07024	64.01756	2.79
Between treat.	2	128.51807	64.25903	2.85
Between sex	2	17.28369	8.64184	<1
P X T	4	973.36084	243.34021	11.16
P X S	4	133.36377	33.34094	1.31
T X S	2	21.12696	10.56348	<1
P X T X S	4	197.74072	49.43518	2.23
Error	258	6,507.79492	25.22401	
Total	281	8,821.42523		

Table 36

Problem 7.

No. Ideas X-Ray Analysis of Covariance

Source of Variation	d/f	S.S.	M.S.	F.
Between Grades	1	.51564	.51564	<1
Within Grades	289	511.06131	1.76838	
Between pairs	4	24.50089	6.12522	3.55
Between treat.	2	8.85158	4.42579	2.57
Between sex	2	.66961	.33480	<1
P X T	4	8.37662	2.09415	1.21
P X S	4	4.46955	1.11738	<1
T X S	2	3.12757	1.56378	<1
P X T X S	4	.54906	.13726	<1
Error	267	460.51643	1.72478	
Total	290	511.57695		

Table 37

Problem 8.

No. Points X-Ray Analysis of Covariance

Source of Variation	d/f	S.S.	M.S.	F.
Between Grades	1	9.02924	9.02924	1.10
Within Grades	289	2,368.48408	8.19545	
Between pairs	4	65.73010	16.43252	2.03
Between treat.	2	3.43036	1.71518	<1
Between sex	2	4.43335	2.21667	<1
P X T	4	70.91010	17.72752	2.19
P X S	4	19.60376	4.90094	<1
T X S	2	7.15558	3.57779	<1
P X T X S	4	31.94666	7.98666	<1
Error	267	2,165.27417	8.10964	
Total	290	2,377.51332		

Teacher Instructions for Administering Torrance Items

Toy Truck
Circles

1. Be sure each child does the following as soon as the test booklets are handed out:

   a. Writes his name on the line on the cover page. Be sure he writes both his first and last name.

   b. Writes your name below the line for student's name.

   c. Writes the date.

2. Read the directions on the cover page, aloud. Do not allow students to turn page until told to do so.

3. Tell children to turn page, and allow them 10 minutes to write on the remaining pages.

   Special directions for Circles Test: Be sure to tell the students: "PUT THE NAME OF THE THING YOU DRAW UNDER EACH PICTURE."

4. At the end of 10 minute period, say "STOP." Allow no further additions by students. Collect the test papers.

5. After the test, please check test papers to see that student's name, teacher's name, and the date have been entered on the front cover of each booklet. A monitor may assist in this.

APPENDIX 10
SAMPLE OF COVINGTON TEST

Before you do anything else, write your name, the name of your teacher and the date in the spaces on the right.

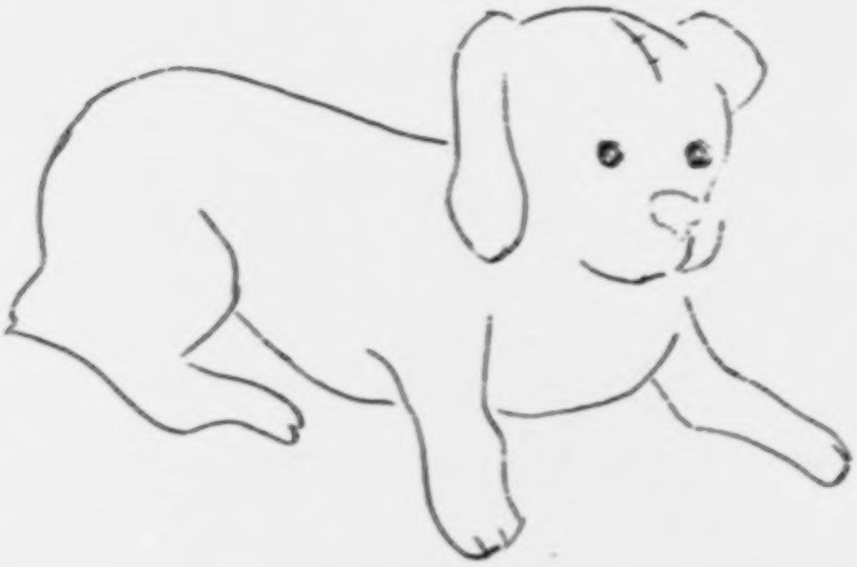
Do that right now.

Your first and last name

Your teacher's name

Date

Below is a drawing of a stuffed toy dog of the kind you can buy in most dime stores for a half dollar to a dollar. It is about six inches long and weighs about three ounces.



In the spaces on the next page, list the cleverest, most interesting and unusual ways you can think of for changing this toy dog so that children will have more fun playing with it. Do not worry about how much the change would cost. Think only about what would make it more fun to play with as a toy. You will have ten minutes to do this.

Spr

SAMPLE OF TORRANCE TEST p. 1 of 6

There is a story that gold was hidden in an old black house in the country, so when the old house was broken into, a detective from the city went to investigate. After several hours of driving, the detective turned off the highway on to a narrow road. He passed a lake and then a grave yard. Finally, he reached the black house.

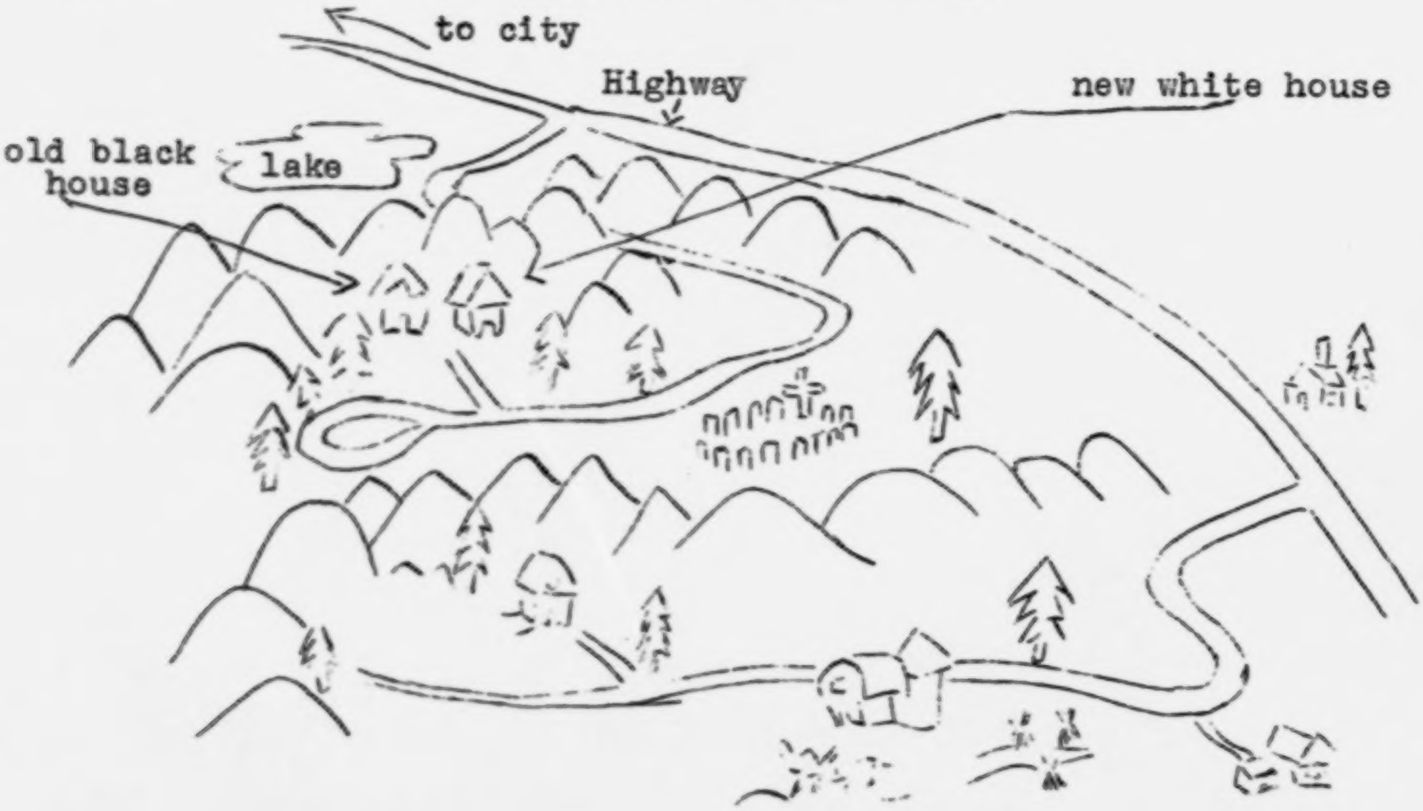
Next door to the black house, was a newer, white house. It was one of several other similar houses in the area owned by a man named Mr. Round. Actually, Mr. Round was the one who was looking for the gold in the old house. He had figured out a plan to scare the detective away from investigating.

After the detective looked around inside the old black house, Mr. Round invited him to spend the night in the white house next door. The detective's room in the white house had only one, small window, but he had a good view of the sunset behind the old black house.

After dinner, the detective felt very sleepy, so he went to bed. In the morning, the detective looked out the small window, and saw the sun rising. But the old house was gone!!! He rushed outside and looked all around. But the black house was gone, and there were no marks on the muddy ground.

Since the black house had disappeared, the detective decided to return to the city. He drove past the barn and turned on to the highway for home.

Here is the picture that goes with the story:



DO NOT TURN PAGE UNTIL TOLD TO DO SO.

What is the problem that you are trying to solve? In one or two sentences, write down exactly what you are trying to find out. Do not write down the story again. Only write down what you are trying to find out.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

There are several odd things in the story and picture that do not make much sense. Can you find them? If you can, then write them down on this page You can go back and read the story again.

1.

2.

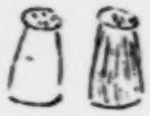
3.

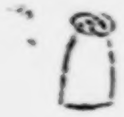
DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

Now work on this mystery problem and see if you can solve it. You can read the story or look at the picture if you want to. Write your ideas for solving the problem down here.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

You have been working on this problem for a long time, so you decide to relax for a few minutes. You go to a cafe and order a hamburger. As you wait for it to come, you look around the room. You notice two salt-shakers, one at each end of the table. Next to one of the salt-shakers is a pepper-shaker.





Now let's stop eating and go back to the problem. Try to think of some more ways to solve the problem. Write your ideas down here. You can go back and look at any pages, if you want to.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

Here is part pf the story. Read it again.

> "The detective's room in the white house had only one, small window, but he had a good view of the sunset behind the old black house.
>
> In the morning, the detective looked out the small window, and saw the sun rising. But the old house was gone!!!"

Now try to think of some more ways to solve the problem. When you get ideas, write them down here.

1.

2.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.